

amateur radio

Vol. 39, No. 10

OCTOBER, 1971

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COVER STORY

The new Yaesu Musem model FTDX-401, which is basically similar to the FTDX-400/560 circuitry, with same p.a. output power. Front panel layout follows that of the FTDX-560. Features introduced in the new model include a noise blanker, c.w. filter, and a cooling fan attached to the p.a. section.

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(or what you
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Page 3

Amateur Radio, October, 1971

A BIT OF LIGHT NONSENSE

J. L. SINCLAIR,* VK8ZSJ

Does the atmosphere affect light in the same way as it causes "reflection" of v.h.f. signals? Obviously the atmosphere does affect light quite markedly at times, hence mirages, but the problem is to decide whether the action is the same in both cases.

Some time ago I lived in a spot that had been selected for its view, an expanse of Adelaide's southern suburbs and Gulf waters with Yorke Peninsula some times visible on the horizon. It was a good spot for v.h.f. DX, too, although I must admit I did not make full use of it. I had often wondered whether the atmosphere would affect light in the same way as it caused "reflection" of v.h.f. signals. Obviously the atmosphere does affect light quite markedly at times, hence mirages, but my problem was to decide whether the action was the same in both cases.

Preliminary thought about the subject led me to several conclusions, such as:

(a) Propagation of v.h.f. is not necessarily a reflection?

A true reflection will have the characteristics of the normal h.f. bands such as skip zones, propagation over long distances with very little loss, and fading due to multi path working. The normal v.h.f. signal exhibits none of these characteristics and so I venture to suggest that most so called DX working (150-300 mile range) is by a type of refraction in the lower atmosphere rather than by the more commonly accepted theory of tropospheric inversion layers. I have no doubt that inversion reflections do occur, but they account for the very much rarer path of 400 to 800 miles.

(b) Weather conditions that cause mirages occur much too rarely to be the same effect as causes v.h.f. DX but it was possible that a bending effect may be observable that could be correlated with radio propagation over a particular path.

(c) The exact nature of refraction had to be understood. I had to sit down and explain it to myself along the following lines:—

(i) Huygens Principle says in effect that a wave motion will always travel at right angles to the plane of the wave front.

(ii) Refraction occurs when a wave hits a medium of different density at an angle and is therefore slowed on one side of the wave front more than the other. In fact when you work it out light does not really travel in straight lines so much as it passes between any two points along the path that takes the least time.

(iii) A definite surface is not really necessary for refraction, a wave front travelling in a medium with any sort of uneven slowing effect will be refracted so long as it is not travelling exactly at right angles to the graduation.

(iv) Such a graduated medium exists in the atmosphere merely by the fact that air pressure is greatest near the ground and shades off eventually to nothing. A wave travelling parallel to the earth's surface will be retarded more by the denser air near the ground and so will always normally have a tendency to dip towards the surface of the earth.

(v) What is important is the pressure gradient which is sometimes less marked than normal, but quite often, more than normal at very low altitudes (up to 200-300 ft. above ground level). The books say that on cloudy, windy nights the gradient is least because the atmosphere is all more or less at the same temperature and on still sunny days for instance the pressure can change quite rapidly with heights for the first few hundred feet.

This was where my perch on the hillside started to appear useful. It seemed to me that the horizon we saw 40 odd miles away should move up and down very slightly with changing weather conditions.

I used the right sight principle to prove that it did in fact happen that way. One "sight" was a bolt on the t.v. aerial (it shows the "monster" is useful for something!), and the other was a graduated scale I attached to my antenna tower 50 odd feet away. Graduations were to the nearest minute of arc and I found a variation of up to 10 minutes between maximum and minimum readings. Later I moved the sight to a pair of posts the same distance apart because the t.v. aerial seemed to be a bit too flimsy for such a thing, but got substantially the same results.

After taking readings of the position of the horizon for most of one summer, I went looking for radio signals to compare them with. Two series of records of real use that I found were contacts between Mick VK5ZDR and Herb VK3NN, and signals from Mick and George VK5GG to Jim VK5ZMJ. Several other people round the Adelaide area were able to give me reports that filled in gaps in the series. From the figures I was able to prepare graphs of:—

- (a) Height of the horizon on each day;
- (b) Signal strength over the path VK5ZDR to VK3NN on each day;
- (c) Signal strength over the path VK5ZDR to VK5ZMJ.

Since VK5ZDR had been by far the most consistent, I used other peoples' reports to fill in gaps that occurred,

reducing all reports to the signal strength that VK5ZDR would most probably have given in the circumstances.

Gaps in the graphs were many and varied, but there were about 40 points in the western path and about 20 points in the northern path that could be used to test my theory that v.h.f. radio and visible light would be similarly affected by day to day weather conditions.

With a book of instructions on statistical methods in one hand and a pencil in the other, I started preparing tables and testing the coefficient of correlation of each set of figures. My first try was to compare signal strengths on one path with that of the other. It yielded the disappointing figure of 0.093, which was not significant. Correlation coefficients are a measure of the chance of one quantity varying in step with the other; they vary between +1 and -1, the figure of +1 indicates that both quantities will always be in step, -1 means that as one gets bigger the other will always get smaller, and 0 or low numbers mean that the two are not really related to each other.

Since the weather in South Australia comes from the west and moves to the east, I reasoned that the reports from the northern path may correlate better with reports from the eastern path at a later time, so I tested a series of tables with respective time differences of 12, 24, 36 and 48 hours. The results I got were:—

Time Difference	Correlation Coefficient
0 hours	-0.093
12 "	+0.255
24 "	+0.086
36 "	-0.001
48 "	+0.079

The best estimate I can make of these figures is that all except the 12-hour difference figure are not related and the 12-hour figure is only slightly probable. None of the results showed a high enough correlation to allow me to combine the two sets of results.

My next sets of figures concerned a comparison between the path to VK3NN and the horizon measurement. In this case there were several occasions when Mick had recorded contacts on 432 MHz. as well as on 2 metres. In this case, I wished to give some weight to the 432 MHz. conditions so I divided the "S" number given by four and added it on to the "S" number recorded for 144 MHz. The graph I made was of this composite "S" number with some other minor changes when conditions were obviously exceptional. In the same way as before I worked out cor-

*C/o. H.F. Broadcast Project, P.M.G. Dept., Darwin, N.T., 5790.

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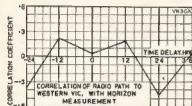
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relation coefficients for the two for a number of different time delays and obtained the figures as follows:—

Time Difference	Correlation Coefficient
Signal 24 hours before h.m.	—0.378
" 12 " " "	+0.236
" at same time as " "	+0.028
" 12 hours after " "	+0.186
" 24 " " "	—0.469
" 36 " " "	+0.040

(Without abbreviations: Radio Signal 24 hours before horizon measurement.)

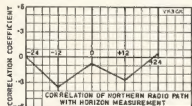


I worked the same procedure with contacts to VKSZMJ although in this case there were no contacts on 432 MHz. and no other really unusual circumstances. The figures I obtained were:—

Time Difference	Correlation Coefficient
Signal 24 hours ahead h.m.	+0.007
" 12 " " "	—0.357
" at same time as " "	—0.081
" 12 hours behind " "	—0.269
" 24 " " "	+0.042

(Without abbreviations: Radio Signal 24 hours ahead of horizon measurement.)

The book had directions for testing the significance of these results and to the best of my knowledge it seems that most of the results are not significant, but a few of the higher ones probably are. The highest figure (—0.469) was only possible by chance once in about 200 to 300 times. The accuracy of the result increases with increasing numbers of trials and in this case there were 35 reports that could be compared. Other figures were:—



(a) When the western radio path was compared 24 hours before horizon measurement it gave a figure of —0.378 with 31 comparisons which had one chance in twenty of being random occurrence;

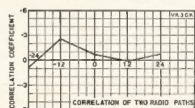
(b) When the northern path was compared 12 hours before horizon measurement it gave —0.357 in 18 trials which could have happened by chance once in about five times.

All the other measurements were less significant and therefore not worth talking about as they stood.

There was, however, one other trick that I tried. I made graphs of correlation coefficient in each case against time difference. The results shown elsewhere looked to me like a sine wave with a heavy second harmonic content so I attempted to fit them to such a thing. In the case of the graph concerning the western path, I found that by moving every sound point a distance of 0.4 in the positive direction, I got a promising fit to a curve of about 2½ days' wavelength and a peak to peak distance of 0.48. I then calculated closer approximations and ended up with a quite presentable graph.

I use an electrical analogy to make it mean something to myself along the following lines. Taking the state of certain yes (correlation +1) as one volt positive, and the state of certain no (—1) as one volt negative, I find that the curve has three components:

- A d.c. component of 0.035 volts negative;
- An a.c. component with a wavelength of 24 hours and amplitude 0.383 volt peak to peak;
- An a.c. component with wavelength 56.5 hours and amplitude 0.508 volt peak to peak.



In this case the errors of the respective points are:

1st point	0.020 (20 millivolts)
2nd "	0.000
3rd "	0.001
4th "	0.000
5th "	0.000
6th "	0.024

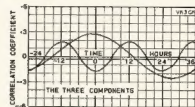
In the graph of the northern path, the figures are small for accurate calculation to be meaningful, but roughly it seems to me like a composite of:

- A d.c. component in the range of 0.1 to 0.2 negative;
- An a.c. component of 24 hours wavelength, amplitude of 0.247 peak to peak;
- An a.c. component of 55 hours wavelength, amplitude 0.18 peak to peak.

After having done all these calculations I am left wondering just what, if anything, I have discovered. I had expected that the graph of correlation against time difference would have shown a strong positive peak in one spot at about 12 hours delay instead of the negative peak found. This would have tallied fairly well with the movement of weather patterns across South Australia.

I also wonder whether I am justified in making graphs of graphs and calculations as I have done, or whether the whole thing is just so much high sounding nonsense. I would like someone of good mathematical authority to

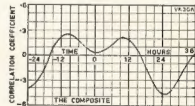
pass judgment on this point and also the significance of my method of fitting the correlation graphs to a pair of sine waves. One point I am fairly sure of is that the figure —0.469 is too high to have occurred by pure chance and requires some explanation, but just what it means has me tricked.



There was another thing I noticed. A smoky line on the horizon about a quarter of a degree wide and up to half a degree above the actual horizon. I believe it could have been some sort of mirage of the sea and it was recorded on the following dates: 23rd October, 1966, 18th February, 1967, 19th February, 1967, and 12th March, 1967.

My records show exceptionally good radio conditions on 23rd October and 18th February, unusually poor but not hopeless on 19th February and average on 12th March. I am not sure what it was in each case that caused me to record exceptional conditions on these days, but it was such things as VK7s worked into Adelaide or stations working westward from under the shadow of the Mt. Lofty ranges, all effects I regard as probably due to tropospheric reflection.

The dates on which such events occurred are also of interest, they were: 23/10/66, 15/11/66, 25/12/66, 7/1/67, 9/1/67, 20/1/67, 18/2/67, 7/3/67, and 29/3/67.



The time intervals between them are respectively: 2½ days, 40 days, 12½ days, 2½ days, 10½ days, 29 days, 17 days and 22 days. There appears to be a suggestion of repetition in these figures of a time period about 20 days or a little longer, or may be two trains of events at 40-day intervals, for instance, 10½ and 29 make 39½ days, 17 and 22 make 39 days, and one 40-day period occurs. I think what I am suggesting is that weather patterns conducive to v.h.f. DX are capable of persisting long enough to make a complete circuit of the globe and take either twenty or forty days to do it (I am not sure which). The circumference of the earth at the latitude of Adelaide is 20,480 miles, which means that a speed of 500 to 1,000 miles per day would be required. Of the two,

(Continued on Page 11)

The Solar Link*

R. A. HAM, F.R.A.S.

INTRODUCTION

The sun, like many other stars, is a nuclear furnace consuming enormous reserves of fuel and radiating energy in many forms. The apparent yellow disc on its surface, the photosphere, has a temperature of around six million degrees, and it is surrounded by a gaseous atmosphere, the corona, which extends a million miles into space and has a temperature of one million degrees. Periodically, dark patches appear on the photosphere; these are called sunspots and are some 2,000° cooler than the surrounding photosphere. Some sunspots are scarcely visible and have a short life, while others are measured in thousands of square miles and can survive a full 27-day solar rotation. Radio energy from the sun may be detected by a radio telescope; when the sun is "quiet" the radio noise detected is of thermal origin and will get stronger as the observational radio frequency is increased from 30 to 10,000 MHz., and the sun is classified "active" when sunspots are present.

The latter are usually accompanied by solar flares that look like great arches of flame when seen through special optical instruments. Very large flares are called prominences, and in July 1946 an event like this raged across 500,000 miles of the sun. Solar flares can be heard on earth with radio instruments 8.3 min. after they originate on the sun, but the particles that are ejected at the time of the event can take up to 40 hours to reach our planet. The radio frequency for detecting solar bursts and noise storms is between 30 and 300 MHz., with a peak around 150 MHz.

The sun can develop a spot at any time and produce the activity which goes with it, and the prime object of this article is to show how the sun can disturb the earth's atmosphere and consequently the earth's radio communication. Another object is to emphasise the need to record the effect of natural manifestations which take place and to send reports on them to R.S.G.B. and other organisations.

OBSERVING SOLAR ACTIVITY

The author's radio telescope was established on 1st June, 1968, to observe the midday sun from 1130 to 1330 GMT daily, using a frequency of 136 MHz. with a bandwidth around 10 KHz. The observations are recorded at a high chart speed of 30"/hour so that detailed information can be gathered from the 5 ft. of chart used during a normal midday observation.

The radio telescope can observe the midday sun whether the sky is overcast

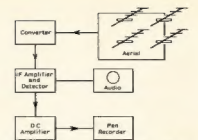


Fig. 1—Block schematic of the author's radio telescope. The aerial is a home-built 4 by 4 element Yagi mounted on a 10 ft. x 6 ft. wood frame 1/4-inch wire mesh reflector.

The converter, mounted on the aerial reflector, is also home-built, transistorised, and operates from 12v. supply. R.F. BF100, mixer AF130, xtal circ. 35.586 MHz and multiplier to 116 MHz., both AF130. I.f. output is 26 MHz.

The i.f. amplifier is an AR88 communications receiver tuned to 26 MHz., which also provides detector and audio output.

The d.c. amplifier is a 700 integrated circuit, powered by 9-0-9v.

The pen recorder is an Everhed & Vignoles 9.5 mA.

or not, and the author's XYL checks the solar image for sunspots daily if the sky is clear by projecting the sun through a 7 x 50 mm. gunsight and producing drawings as shown in Fig. 2. (Warning: never endanger your eyesight by viewing the sun directly through any optical instrument, always project the image.)

It was obvious from the very early recordings that the instrument would distinguish between the individual solar burst which may last a few minutes and the continuous noise storm lasting several days. As time went by this ability to separate and identify the two events proved most valuable when making reports to the British Astronomical Association and the R.S.G.B.

An individual solar burst, illustrated in Fig. 3, is less likely to strike the earth's atmosphere because of the time lapse between the origin of the event and the particles reaching the earth, by which time the earth has moved further along its orbital path. On the other hand a long series of individual bursts or a continuous noise storm lasting several days must bombard the earth's atmosphere somewhere. Contact with the earth's atmosphere by a huge stream of solar particles can cause an aurora at either of the earth's polar regions, and a particle stream can also disturb the Appleton layer of the ionosphere and cause a temporary total loss of h.f. band radio signals, known as a Dellinger fade-out.

The author has observed many examples of solar activity and the consequent disturbance to the earth's atmosphere and has selected two of these examples from his records.

Solar recordings for 1st March, 1970, showed several large individual bursts which sent the pen full scale, plus a slight increase in the general noise level. Solar recordings for the 2nd and 3rd were similar to those of the 1st, but with a lower burst amplitude; by the 4th a full scale noise storm was in progress which died down on the 5th. Many individual low amplitude bursts were recorded on the 6th and 7th. The

climax of this period of solar activity was the great aurora on 8th March which was fully reported by Ray Plavell in the September 1970 issue of "Radio Communication" and by the author in "Electronics Weekly" of 29th April, '70.

The second example came when a mammoth sunspot appeared on the photosphere around 11th November, 1970, and remained there until the solar rotation carried it out of view on the 21st. On the 12th the radio telescope showed a marked increase in the solar noise level and the polar diagram of the telescope aerial could be seen on the chart. By switch-on at 1130 GMT on the 13th, a noise storm was raging on the sun, getting stronger on the 14th and giving almost full scale deflection on the 15th. The solar noise was so strong on the 16th that the pen was at full-scale deflection for the whole period of the observation, and this was repeated on the 17th and 18th. On the 19th the noise was three-quarter scale; on the 20th down to half scale; and on the 21st a few tiny bursts above the receiver noise level. The earth's atmosphere was bathed for 10 days in solar ejected matter and according to reports there were three Dellinger fade-outs on the 15th and 16th—from the author's observations the atmospheric noise level was very high after sunset on the 16th.

Two examples do not do justice to the value of a solar radio telescope, but they will explain what happens at the time of solar activity and the events which can follow.

THE IONOSPHERE AND THE TROPOSPHERE

Terrestrial radio communication relies upon two regions of the earth's atmosphere named the troposphere and the ionosphere, the former occupying the first 10 miles above the surface and the latter extending from 40 to 200 miles above the earth. (See propagation section of the Radio Communication Handbook for details of atmospheric reflection of radio signals.) The heavy-side (E) layer of the ionosphere forms at sunrise and disperses at sunset, but sometimes solar activity will cause the E-layer to form or break up into patchy clouds of dense ionisation. This latter phenomenon, called Sporadic-E, will be known to the users of the 4 mx band when its normal peace is disturbed by Continental broadcast stations which use the band nearly 1,000 miles away.

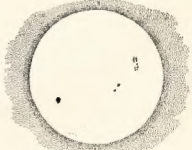


Fig. 2—Sunspot drawing.

* Reprinted from "Radio Comm.," August 1971.

Although Sporadic-E is rarely evident above 100 MHz, on 4th July, 1965, an extensive cloud of dense ionisation centred over Europe influenced the 2 m band, and it was fortunate that a 2 metre contest had just started and many U.K. contestants were able to work the Hungarian station HGSDKQ/P and gain the points for a 900-mile contact. Had it not have been for the contest this rare Sporadic-E opening might have gone unrecorded.

A typical large Sporadic-E occurred on 8th July, 1970, when at 0700 GMT a considerable number of Continental stations could be heard between 30 and 50 MHz. By midday the E-layer disturbance had spread its influence to the B.B.C. f.m. broadcast band and at 1430 GMT the author counted 14 Continental broadcast stations audible between 88 and 98 MHz. At 1900 GMT there was the usual interference to B.B.C. band 1 television and a large number of long distance sync. pulses around 50 MHz. The 4 m U.K. Amateur band was impossible to use owing to the strength and bandwidth of the continental continental stations. At 2045 GMT the reflecting E-layer faded and other change and the prevailing chaos stopped abruptly. Suspicious about this sudden end to an E-layer disturbance, the author turned his 4 m beam north-west and for the following hour heard the 599 signal of the Icelandic beacon TF3VHF on 70.275 MHz.

Line-of-sight v.h.f. signals above 100 MHz. rely for their path on the prevailing conditions within the troposphere, which is the home of the earth's weather and this can be very hostile to v.h.f. radio signals. Apart from the attenuating effect of the weather itself, there is the thunder static which can ruin reception.

The accepted range of a v.h.f. signal under normal tropospheric conditions is between 50 and 100 miles, but under abnormal tropospheric conditions this range can be multiplied by 10. The reason for this has been the subject of many articles in "Radio Communication," and over the years the author has noticed that when the atmospheric pressure is above 30 in. and then rises again, there is a good chance of a tropo opening at the point when the pressure starts to fall. Typical examples of 2 m openings coinciding with the pressure falling are the contests on 4th-5th March, 1967, when the band was open from GW to DJ, and on 20th November, 1967, when a two-day opening brought signals from OZ to the south of England. There was a four-day tropo opening in March 1969. In May 1970 a sudden pressure drop in the

final hour of a 2 metre contest brought up the signal of HG9AEN/P. Another large tropo opening took place in November 1970.

The author conducted a three-month experiment starting on 1st June, 1969, during which the atmospheric pressure and the signal strength of GB3GW, 130 miles away, were recorded three times a day. A graph at the end of the observation showed that the signal strength of the R.S.G.B. Swansea beacon came up just before the pressure was due to fall.

The troposphere can change its condition at any time, so it is vital to have a permanent signal to observe, and the R.S.G.B. has fulfilled this need by providing several 2 metre beacons. With knowledge of the terrain between himself and the beacon an observer can tell the extent of the prevailing tropo openings, and without the beacons the v.h.f. bands for some periods would be written off as unusable. Two metre contests are very important to tropospheric studies; in addition to the personal satisfaction gained by the entrant, the contest logs are a record of v.h.f. activity and when analysed can have considerable scientific value.

SOLAR ACTIVITY AND THE WEATHER

The routine work at the author's station includes checking the 4 and 6 metre bands for ionospheric disturbance, recording the atmospheric pressure, noting the prevailing weather and checking the 2 metre band for tropospheric openings. As the daily records of solar, atmospheric and weather events were accumulated it became apparent that a new factor was emerging from them. It was seen that a relationship existed between certain types of solar activity and severe weather conditions.

Until recently the author, like many other people, was sceptical about the sun disturbing the earth's weather, despite scientific literature quoting climatic changes at the time of peak sunspot activity. But general opinion suggested that a positive connection between the sun and the earth's erratic weather had yet to be found.

To look for this connection in the station's records it was necessary to extract the solar and weather information, and to get a definite meaning into the extracted data the author decided to classify both the daily solar and weather observations into two states, **active** or **inactive**, and make a comparative table from the results. The sun was classified as **active** if some form of solar output appeared on the daily

recording charts, while the weather was classified as follows:

Inactive: Sunny, cloud, overcast, fog, frost, mist.

Active: Wind, rain, gale, snow, blizzard, thunder.

The classified sun/weather log kept from 1st June, 1968, to 30th April, 1971, produced the following set of figures.

Observation period, 1,084 days.

Sun active: 610 days

Local weather active: 402 days

Sun and weather active 253 on the same day.

Taking a general view of this 1,084-day period one can see that the coincidence of the sun and weather being active on the same day is 253 out of 402 (62.9 per cent.), which from these figures one could expect. It is obvious that when other factors, such as solar activity outside the author's observation time and national plus international weather reports, are taken into account the percentage scale would alter considerably. However, the author believes that the type of weather classified in his records as **active** and observed from his station is representative of weather over a much larger area.

Major weather events reported by the national news media (not included in the station weather log) were noted when possible, and one can be sure that if they made national news they were something big. A closer study of the actual solar condition which coincided with these major weather upheavals revealed that a solar noise storm lasting several days was the main culprit, as the following four examples will show:

November 1970. A month of activity from both sun and weather. During the first five days many small bursts and a few large ones lasting several minutes were recorded, while the weather on the 2nd and 4th was wind and rain. For the next six days both the sun and weather were intermittently active until the 12th when a severe solar noise storm started and carried on until the 21st. The local weather was wind and heavy rain from the 12th to the 19th, and the rainfall, checked by the XYL, was: 13th, 1.38"; 14th, 0.83"; 15th, 0.62"; 17th, 0.39"; 18th, 0.82"; and 19th, 0.11", making a total of 4.1" for the six days which coincided with the solar storm. The national news carried the story of the severe flooding in East Pakistan, and was again coincided with the solar storm.

December 1970. The first 16 days saw little activity from the sun or weather; the radio telescope recorded a few bursts and the calm weather was interrupted by occasional rain. On the 17th a solar noise storm developed and lasted until the 23rd, and on the 17th the weather went active. Wind and rain developed into a white Christmas with its snow, blizzards and extreme cold. The news media reported severe blizzards in Europe and that some countries had seen snow for the first time.

January 1971. The cold weather from December was carried into the new year. The end of the cold weather came on the 6th-7th, and a few days of wind and rain prevailed. The thaw coincided with the start of a solar noise storm which lasted until the 13th

(Continued on Page 10)

Fig 3
Isolated solar
bursts



Fig 4
Continuous solar
noise storm



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THE SOLAR LINK

(Continued from Page 9)

Around the peak of this solar storm the news reported freak mild weather on the 10th throughout the U.K. with record January temperatures. The sun and the weather were unsettled for the five days which followed the solar storm, and on the 18th another noise storm started and continued until the 25th. During this solar storm the weather developed, providing heavy wind and rain, severe gales, and a whirlwind in south-east England; and on the 21st the atmospheric pressure recorded by the writer was down to 973 mb. A further solar noise storm broke on the 28th and ended on the 31st, and with it came very active weather. A windy day on the 28th preceded a calm 29th, but on the 30th wind, rain and snow prevailed throughout England and Wales. The news services reported floods in Poland and severe floods in Mozambique; Australia had 9" of rain in one day, and the River Thames was in risk of flooding owing to severe gales in the North Sea.

April 1971. There were two solar noise storms during the month. The first started on the 9th and ended on the 17th during which period the new U.K. to China h.f. telephone link was delayed by "atmospheric disturbance". The news service announced on the 15th that the monsoon in East Pakistan had started a month early. A B.B.C. news report on the 21st May about the Mount Everest expedition said that the weather on the 16th-17th April on the mountain had been the worst for 72 years. From the 18th to 24th there were a few solar bursts and the weather was mainly fine apart from rain on the 23rd. On the 25th the second solar noise storm started, and on the 26th there was rain, sleet and snow across southern England with roads blocked in the West Country. The news media reported the coldest April day since records started in 1940.

ACKNOWLEDGMENTS

The author would like to make acknowledgment to the R.S.G.B. for the beacon service and to the beacon committee to ensure that a permanent signal is transmitted 24 hours each day. A word of praise also for the members who enter the v.h.f. contests, especially the portable stations that provide signals from exotic sites which are compared with prevailing atmospheric conditions, for the valuable work of members of the Scientific Studies Committee who ponder and advise on the observers' reports, and for Jack Hum who in "Four Metres and Down in "Radio Communication," reports on v.h.f. activities.

ANOTHER A.O.C.P. THEORY CLASS

Owing to demand, the Victorian Division of the W.I.A. plan to commence another theory class, to be held on Saturday mornings from 9-11 a.m.

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Development of an All-Band Vertical*

H. S. BROWN, G3RFG

On arriving at his present QTH the author found that the ground space available for the erection of aerials measured only 30 x 10 ft. and another restriction was that nothing that looked like an aerial was allowed. In order to get on the air a self-supporting mast that could be raised or lowered easily by one person was erected and it has since been used during many aerial experiments. As a result of these experiments it became obvious that what was required was an all-band vertical that produced low impedance at its base for all bands, and the result is shown in Fig. 1.

The aerial is made up of three lengths of aluminium tubing 12 ft. long, with 1/16" walls, and of 1", 1 1/2" and 2" diameter respectively. One end of each of the two thicker tubes is slit down for several inches and the three lengths are then spliced together, the joints being secured by two Jubilee clips. A triangular piece of thick Perspex is fitted between the top two clips, and three lengths of thin nylon cord are connected to it as guys to prevent movement of the top section of the aerial. The 1 1/2" length (quarter-wave on 10 metres) is cut from the lower 1" diameter section and the two resulting lengths are secured to the mast, one above the other and 2" apart, by stand-off insulators.

The 2nd break in the aerial is then linked and a check made for resonance on the 40 and 15 metre bands. The link is then replaced by the coil and the taps adjusted for resonance on 20, 80 and top band. If an impedance bridge is used it will be found that it will indicate approximately 25 ohms on 40 metres and 35 ohms on 15 metres. It was decided to use two lengths of 15 metre coaxial cable in parallel to provide the best match on 15 metres because of the greater output power on 40 metres from the author's transmitter.

On 10 metres the aerial can be used as a normal vertical; by removing the base feeder and connecting a length of 75 ohm co-axial cable to the junction it becomes a vertical dipole; and by earthing the lower section and feeding the junction with 50 ohm co-axial cable it becomes an elevated-feed three-quarter-wave vertical]

The earthing system consists of as many earth rods as possible connected together with thick seven-stranded copper aerial wire. It was also found

* Reprinted from "Radio Comm.," August 1971.

that t.v.i. could be decreased if a length of this earth-wire was run parallel with the feeder from the base of the aerial right back to the Z Match. The author's feeder is run underground as far as is possible.

Over a period of two years this aerial has proved a winner and it is only necessary to stand on a step ladder in order to change bands; by inserting the link or connecting the appropriate fly-leads from the coil which is attached to the mast by stand-off insulators.

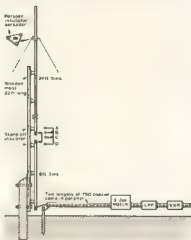


Fig. 1

COIL DETAILS

It is recommended that anyone who constructs this aerial should use a g.d.o. to find the exact taps on their coils for resonance on the various bands, but the following coil construction details are supplied as a basis. A ribbed ceramic former of 2" diameter is wound with 55 turns of 20 a.w.g. tinned copper wire. The first 40 turns are spaced 1/16" apart, and the bottom 15 turns are close wound and enamel covered. Fly-leads are connected to the top, 22 turns down (for three-quarter wave on 20 metres), 29 turns down for 80 metres, and at the bottom for top band.

	S.W.R.
Link out, Coil out	$\frac{1}{2}\lambda$ on 10 m μ * 1:6
Link in	$\frac{1}{2}\lambda$ on 40 m μ 1:1
Link in	$\frac{1}{2}\lambda$ on 15 m μ 1:4
Coil in, A to B	$\frac{1}{2}\lambda$ on 20 m μ 1:2
Coil in, A to C	$\frac{1}{2}\lambda$ on 80 m μ 1:4
Coil in, A to D	$\frac{1}{2}\lambda$ on 160 m μ 1:4

* On 10 metres the aerial can be used in two other ways:

- (b) Earth the lower section and connect a 50 ohm feeder to the junction to make an elevated feed three-quarter wave vertical. The s.w.r. is 1.4.

A BIT OF LIGHT NONSENSE

(Continued from Page 7.)

the smaller, corresponding to a 40-day period, is fairly close to the actual rate of progress of weather across the State.

There are no really definite conclusions to be drawn from all this. I don't regard the job as finished, but as a pointer to more exact experiments with better control of conditions. I think it not silly to say that if taken far enough it could lead to information as valuable as that on which the Ionospheric Prediction Service relies for its work. The subject should be an ideal one for somebody who wants material for a thesis and could be expanded to include comparison of propagation of different bands. As a first step, I should think the correlation would be very much higher for signals of different frequencies over the same path. Another refinement of interest would be to measure the path as a guide to distance to find which better conditions for stronger signals over short distances at the same time as they cause the maximum distance of usable signals to be increased.

In conclusion, I offer my thanks to all who allowed me to search their log books and wish good hunting to anyone who can take this project a step further.

PROJECT AUSTRALIS REPORT

A.M.S.A.T have now advised W.I.A. Project Australia that the frequencies to be used for the A-O-B Satellite are as follows —

- (a) **VK Translator System:**
Uplink—145.80, 145.85, 145.90, 145.95 MHz
Downlink—435.10, 435.15, 435.20, 435.25 MHz
- (b) **DJ Translator:**
Uplink—To be decided.
Downlink—145.90 MHz.
- (c) **A M S.A.T. Translator:**
Uplink—145.90 MHz
Downlink—29.90 MHz.

The Australia-wide f.m. Repeater and Simplex channels in the 2 metre band are.

Repeaters—		In	Out	
Channel		MHz.	MHz.	
" 1		166.1	165.8	Secondary
" 2		166.3	165.7	Future
" 3		166.3	165.8	"
" 4		166.4	165.9	Primary
Simplex—		MHz.		
Channel		145.554		
" B		145.000		Primary
" C		145.146		

The possible solutions to these frequency conflicts proposed by the Australis Group are:

- (a) Changing the satellite channels

- (b) Changing the VK repeater channel frequencies.
- (c) Turning off the VK repeaters during each pass of the satellites.

Solution (c) would appear, at this stage, to be the only practical way of solving the problem, as the satellite frequencies are an optimisation of frequency conflicts all over the world.

A modified "demonstrator" version of one channel of the VK translator is being sent to A.M.S.A.T. for testing on 20th August. If A.M.S.A.T. are satisfied that it meets N.A.S.A.'s rigid performance specifications, the Australia Group will begin construction of the flight

The flight units of the A-O-B 80-channel r.t.t. telemetry system and the 35-channel command system are nearing completion and should be shipped to A.M.S.A.T. in Washington next month.

The launching of the A-D-B satellite will take place, it is hoped, about the middle of 1972.

—Richard Tookin, Chairman,
W.I.A. Project Australia.

(All comments on the frequency conflicts listed above should be sent in the first instance to the Federal Repeater Secretariat, C/o. Tim Mills, VK2ZTM.—Ed.)

Getting to know your Neighbour

HOWARD RIDER VK3ZJY

On Sunday, 27th June—having been in Djakarta for two days—I decided it was high time that I met some of the Amateur fraternity. Armed with a single name—K. W. Kwik—who lived at Djalal Maluku 52, which, according to my map, was close to the hotel in which I was staying, I set out not quite knowing where I would finish.

Finding the house was not as difficult as I had expected. A notice proudly stating this was the home of YB0CJ was well in evidence. In a very short time I was seated in the lounge room sipping tea and discussing common and specific interests of Amateur Radio with Kwik and his wife. The latter was not only interested but very knowledgeable in this field.

I learned of the general operation, various regions, regulations and examination procedure which will be described later. Besides being QSL manager for the Djakarta region (YB0), Kwik was also one of the Examination Officers, so my start could not have been at a better place.

A phone call and I was taken out to meet the President of the group—Suwondo (Wondo) YB0AT. He added to my already extensive set of notes and I learned that I had just missed an old friend, I. N. Dar (VU2BX), with whom I had spent many an enjoyable hour when living in New Delhi.

Many miles further on we visited the home of R. A. J. Lumenta Kakkum, YB0BY, whose call sign is a very well known one. I was a little surprised to learn that his wife was Secretary of the local group and more still when I found that she was YD0HV (Erica). Sidik (YD0DH) was also a visitor, so we all sat down together and had supper.

Coffee naturally was served in the "shack" where a couple of contacts were made with YB2AJ and a JA. This was an important occasion as they would be the last ones to be made in this country for fourteen days. Because of the advent of National elections, the Amateurs had decided to maintain radio silence from one week before to one week after this period. This was not requested by the government but was a voluntary decision.

As the evening wore on we talked further of the peculiarities and problems common to both countries, particularly with regard to distances. Two VKs were already well known—Hebbie VK2AQK and Ron VK3AHJ. Beautifully bound copies of many issues of "Amateur Radio" and an Australian electronics magazine were produced, giving further evidence of unseen friends in VK-land.

Some six hours after my initial meeting with Kwik and his wife I was driven back to my hotel. During this whole period I had found great warmth and generosity in the friendliness and

hospitality offered to me, remembering that I had arrived unannounced and unexpected.

What then constitutes the Indonesian Radio Amateur? During the evening I had met people ranging from a Major-General in the Air Force, a retired businessman, an engineering manager, a housewife to an odd-job man—proving that in this country also Amateur Radio is not for the chosen moneyed few but for all who have an interest and the ability to learn and pass the examination.

The examination is not an easy one, in many respects harder than ours. It is divided into three graded levels:

- (a) **Preliminary Level.**—A knowledge of local and international regulations, theory, practice and Morse at 5 w.p.m. will gain a limited licence (YD), enabling crystal controlled operation between 3.5 and 3.9 MHz. at 10 watts maximum input.
- (b) **Intermediate Level.**—An increased knowledge of the above plus Morse at 8 w.p.m. and an ability to understand the English language will allow for a limited licence (YC) with crystal controlled operation in the h.f. (except 14 MHz.), v.h.f. and u.h.f. bands at a maximum of 75 watts input.
- (c) **Advanced Level.**—Further knowledge of the above plus Morse at 12 w.p.m. will allow a full licence (YE) on all bands at a maximum input of 500 watts.

It is interesting to note that Morse code is a requirement in all levels and a good working knowledge of English in the higher two sections. Part of the practical test is the actual building of a transmitter by the applicant.

Although the Indonesian Government has considered and approved regulations and technical qualifications needed by an operator and his station (1967/68), it has for the moment delegated the authority of examination procedure to the Regional Groups of which there are nine. As can be expected, these Groups keep a very tight rein on those wishing to obtain a licence and the operation when actually on the air because they do not wish to lose any of the advantages given to them.

Even so, there are over 2,000 Amateurs in the whole of Indonesia (approximately 250 in Djakarta). Why then do we not hear more of them on the air? The answer is mainly a monetary one. Most rigs are on the 3.5 MHz. band and are a.m. types. Those owning commercial s.b. equipment in the country total fifteen (excluding expatriates) of which I had seen three in one evening.

Unlike many other countries, Indonesia is radio minded. A few years ago Kakkum (YB0BY) started teaching

four persons the fundamentals once a week of about two hours duration. Early this year he had to give up this undertaking because of a change in his work plus the fact that the group had grown to more than 130 per session. Five other Amateurs have taken over this important task.

While all that I have mentioned so far gives a very promising future for Amateur Radio in Indonesia, it must not be thought that there are no problems. In fact, the reverse is the case and the problems are great. While there are people like Kwik, Wondo, Kakkum and Erica, plus many more I have yet to meet, these problems will slowly be overcome. There is much that we, through the W.I.A. and personally, can do to help the movement in this rapidly developing nation.

It is obvious that my life in YB-land, which will last at least a year, will become a very interesting one radio-wise as my main work will take me to all regions and to Amateurs whose total income per year is less than the average Australian gets per week.

★

JAPANESE TRANSISTORS

Through the courtesy of Peter Williams, VK3IZ, "A.R." now possesses specifications and ratings of a number of Japanese FETs, v.h.f. and p.a. transistors. He believes that many Amateurs possessing Japanese equipment may be interested in these ratings if replacements are required at any time. The lists run into several pages, mixed in with Japanese calligraphy and are by courtesy of the "CQ" (J.A.R.L.) Handbook.

If any reader is interested in any of the information, would he please write to the Editor giving title number so that in a future issue it may be possible to extract data of the more popular varieties for publication in "A.R."

★

ERRATUM

Re the article "Angle Modulation", Lecture 14B, in "A.R." August 1971, page 3. The author has pointed out that a few lines have been omitted from the first paragraph under the heading Frequency Modulation in column 1. The paragraph should read:

When using an audio frequency voltage to produce f.m. it is the amplitude of the voltage which causes the carrier frequency to shift or deviate symmetrically from its assigned frequency. By international agreement the maximum deviation is ± 7.5 KHz. for sound broadcasting with an audio frequency pre-emphasis of 75 micro-seconds. However, in Australia for television sound the maximum deviation is ± 50 KHz. and audio frequency pre-emphasis of 50 micro-seconds.

REPEATER SECRETARIAT

We have been advised from V3Z that additional repeater systems are being developed at the moment and some have been lodged with the P.M.G. for approval.

Central Coast, Gosford. To serve the area north of the Hawkesbury River, south of Lake Macquarie and east to the coast from the Pacific Highway. The equipment is to be installed at the local clubroom site, which is about 4 miles south-west of Gosford on a ridge of high ground. To avoid interference in Sydney to the expected strong signals from Wollongong, the antenna will have reduced gain in the southern direction. It will be a Channel 1 system.

Central West, Orange. This system has been operating for some years and is located on Mt. Canobolas. At the moment it is a Channel 1 input with a Channel 4 output.

Blowers Branch (Wollongong). of the N.S.W. Div. is to establish a Channel 1 repeater some 60 miles south of Sydney. It will serve parts of Sydney, Wollongong, the south coast towards Batemans Bay inland towards Canberra, which will cover much of the Hume Highway from Liverpool to Goulburn and on towards Yass. The repeater will be tested in the Wollongong area first and later it is hoped to install it on the high ground west of Katoomba near the t.v. station. There is also a plan to establish a 8 max beacon in the Wollongong area.

Hunter Branch, Newcastle. Permission has been granted to establish a Channel 4 system for this area on Mt. Sugarloaf. It is to be installed at the local t.v. tower site.

Sydney. The Channel 4 system for this area is currently using an A.W.A. link in place of the previously advised S.T.C. link. The original beacon facilities have not been included at this stage. Identification is by a voice tape loop, but will be replaced by an IC keyer.

Wagga Radio Club is to establish a Channel 1 system to serve the eastern Riverina. At the time these notes were compiled the final site was not known to us. The equipment is expected to be low powered and solid state.

Another problem area is Melbourne and possibly Sydney where several repeaters are (or will be) operating. The original 3-channel concept of Wodonga (1968) was for Channel B simplex and Channels 1 and 4 for repeaters. The reason behind this was to ensure that no "service" repeaters (like the present f.m. system) were developed on the minimum number of channels so the maximum of people would have the required crystals and accordingly be able to use the system no matter what part of Australia one travelled to.

The problem has arisen in Melbourne where they have Channel 1. To the east in Gippsland and to the south-west at Geelong there are Channel 4 systems. It will not be long perhaps before a system could be linked to the north. The Channel 4 systems both have good coverage into Melbourne with the result that one is often able to trigger both units. The question to be resolved is: (a) should there be additional channels? (b) should the coverage of overlapping systems be reduced to limit interference? (c) or put up with the problem, if not too severe, so as to preserve the two-channel concept? What do you think?

The F.R.S. Report mentioned in recent "A.R.'s" was delayed in publication, but should be in circulation by the time these notes come out. The Federal Repeater Secretariat is a committee of three members who act on behalf of F.R. in co-ordination of v.h.f./u.h.f. matters with repeaters, beacons, nets and satellites, etc. The postal address for the F.R.S. is C/o P.O. Box 342, Crown Nest, N.S.W. 2085.

Looking forward to hearing Amateurs' views on the points covered in this report, but please bear with us if we are a little slow in the reply, we usually have trouble in rounding up a good one-fingered typist.

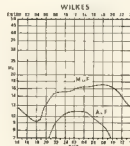
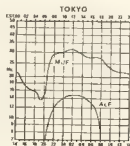
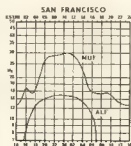
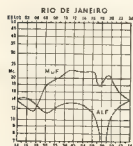
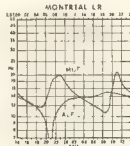
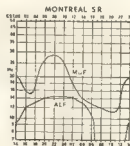
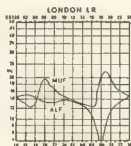
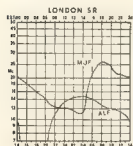
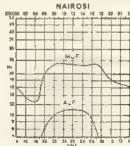
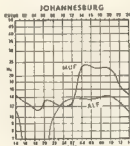
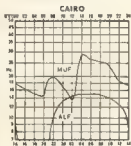
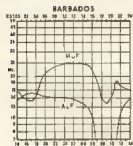
A service to members only COMPONENTS FOR HOME-BREW GEAR

For lists of components actually available from stock, write to—

THE DISPOSALS COMMITTEE,
VICTORIAN DIVISION, W.I.A.,
P.O. BOX 65,
MT. WAVERLEY, VIC., 3149.

PREDICTION CHARTS FOR OCTOBER 1971

(Prediction Charts by courtesy of Ionospheric Prediction Service)



OBSERVATION POST

By H. F. Everick

"There is more in heaven and earth, Horatio, than is dreamt of in your philosophy"

How many times have you read a reason for Amateur Radio? When frequencies come up for discussion there are always people who are ready to say Amateur Radio is finished, washed up kaput.

They say the shiny black box has killed the art.

They believe that a number of Amateurs today cannot even service their shiny black boxes; and, even if they could, they would not dare do so for fear of depressing the re-sale value.

Others come up with the argument that commerce as a way ahead of us and what's more will become even further ahead as the result of research and exploitation of new techniques.

Stop a moment. Was it really been any different? Were all the pioneers of electricity and electronics Amateurs? Did an Amateur invent and develop the semiconductor?

And what about all those old time sets? I can remember many an old time piece of commercial gear. I must admit though that the percentage of home-brewing was higher yesterday. But set against this, the number of Amateurs was very considerably less. How many Amateurs were licensed in 1938 compared with today's total?

Yes, you will say, in those days we did all our own metal bashing. This was after the breadboard went out of favour and components had to be connected with wire connections instead of screw-type connectors. The hook-up wire pen as disappeared. Commerce developed the gimmick, you will say, and we Amateurs merely followed suit. Along came disposals gear which we merely adapted to our own purposes. We followed the techniques of printed boards, many of us have thrown out the valve except possibly for r.f. power amplification because it is cheaper.

Now we need slim fingers, pencil point soldering irons and magnetic glassware constructional work. Heavens above, I do believe we even buy printed circuit boards all made up ready to solder in the appropriate components. Better jobs, we may hook up a row of ICs and hey presto, there is a receiver ready to go. No need to bother with modules even.

Yes, I do not doubt the facts. Rather than becoming pessimistic about these trends, however, I feel a little optimism about it. It is good that the commercial go ahead and become ever more specialised. What a splendid thing this is for us.

Make no mistake. We Amateurs are still the only mob who not only communicate around the globe, but, to a large extent, can hopefully keep our gear pushing out the warts and our receivers bringing in the intelligence under all kinds of adverse and difficult conditions. The specialist must ever strive beyond his horizon but nevertheless must keep his feet on the ground. What better way for him to keep in touch with ordinary mortals than through Amateur Radio which is a blending of a whole range of skills, specialised and ordinary. Amateur Radio is unique and limitless as someone said the other day.

It is not solely a question that the world needs people to do something for no cash reward. Without the Amateur Service and its influence the electronics business might not be where it is today. There is constant feedback between the two. By definition the amateur concentrates on one field of activity. By his achievements in many diverse spheres of activity is the Amateur known.

LICENSED AMATEURS IN VK

JUNE 1971

	Full	Lim.	Total
VX0	11	1	12
VX1	85	20	115
VX2	1430	487	1907
VX3	1310	891	1971
VX4	533	204	727
VX5	518	237	745
VX6	367	138	505
VX7	156	86	241
VX8	37	12	49
VX9	99	11	110
	4516	1830	6352
			Grand Total

THE SOUTHERN CROSS AWARD

The Southern Cross Award was instituted on 1st July this year to promote more activity on all Amateur bands. The Award is prominently Australian by its name, the colours being green and gold.

Conditions of Award Australians and New Zealanders to work 15 members of the Eastern and Mountain District Radio Club. DX stations to work five members of the Club, or three members of the Club plus VK3ER—the official Club Station, which counts as two contacts.

This Award is open to all Amateurs and S.w.i. Band and mode endorsements are available.

Australian Amateurs must forward the sum of 50c with their application. Overseas applicants must enclose eight IRCs. This Award is free to the legally paralysed or the blind.

Applications are by an extract of the log only, countersigned by two other Licensed Amateurs, being sent to the Awards Manager, Eastern and District Radio Club, P.O. Box 87, Mitcham, Vic., 3132.

As this Award follows the Certificate Hunter Club conditions it will count for C.H.C. credits.

VK3ER is active on all h.f. bands, 144 MHz a.m. and f.m.

DISTANCE TABLE FOR ROSS HULL MEMORIAL V.H.F. CONTEST

Computer Great Circle distances with first order corrections for non-spherical earth shape. Accuracy ± 2 miles.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1		0	1172	820	2019	1801	595	1905	1635	1827	394	722	844	408	238	1598	1328	1373	720	1198	2003	693
2	1172		0	1235	3141	2133	1760	2639	1755	2817	1488	1805	1642	1515	1286	1490	239	2136	1281	2074	3071	1887
3	820	1235		0	2586	1219	1217	2589	809	2530	1179	1534	1445	1175	1061	1260	1241	1037	1262	856	2647	1254
4	2019	3141	2586		0	1436	1434	472	3207	568	1659	1508	1534	1890	1331	3328	1716	1344	2086	302	1352	
5	1801	2133	1219	1434		0	569	1571	1773	1770	991	1128	1032	864	1018	938	2248	313	471	894	1569	638
6	595	1760	1217	1434	569		0	1375	1559	1333	327	533	437	290	426	223	1924	830	150	1122	1447	118
7	1905	2639	2589	472	1571	1375		0	3292	192	1515	1274	1307	1500	1707	1347	3147	1880	1332	2254	150	1320
8	1635	1827	809	3207	1773	1559	3292		0	3280	1773	2332	2230	1965	1868	1948	1654	1508	1569	1158	3321	1891
9	1827	2817	2550	658	1770	1333	192	3280		0	1434	1611	1205	1422	1457	1337	3031	1516	1312	2285	383	1900
10	394	1488	1179	1659	991	327	1515	1274	1434	1611		0	300	280	300	240	549	1689	1085	478	1319	1521
11	722	1805	1534	1508	1128	533	1274	2332	1181	380	1434	300		0	103	374	400	732	1973	1364	655	1830
12	844	1642	1445	1308	1032	437	1307	2230	1205	295	103	103	374	400		0	275	416	841	1843	1264	504
13	408	1515	1175	1834	864	290	1508	1665	1422	39	374	275	416	841	1843		0	229	512	1993	1051	440
14	238	1286	1061	1860	1018	426	1707	1689	1617	200	400	416	229	512	1993	1051		0	707	1689	1158	642
15	720	1198	1262	1373	1508	1328	1347	1948	1337	549	732	841	512	707	1689	1158	642		0	2080	855	77
16	1328	239	1241	3328	2248	1924	3147	1854	3031	1689	1873	1843	1965	1469	2090	0	2185	2047	2114		3273	2228
17	1074	2116	1057	1719	313	830	1890	1508	1916	1035	1364	1294	1051	1136	855	2186	0	731	375	1871		765
18	720	1801	1262	1344	471	100	1332	1368	1312	478	855	994	440	842	77	2047	731	0		1052	1385	181
19	1198	2074	856	2647	894	1122	2524	1168	2285	1319	1639	1593	1397	1339	996	2114	375	1052	1385	0		2245
20	2003	3071	2647	302	1569	1770	189	3321	383	1621	1409	1431	1802	1917	1508	3273	1871	2245	2245	0		1385
21	693	1887	1264	1352	505	118	1328	1841	1300	443	617	525	405	411	118	2026	765	1385	1385	1385	0	

1—Adelaide	5—Brisbane	9—Dunedin	14—Mt. Gambier	18—Sydney
2—Albany	6—Canberra	10—Geelong	15—Newcastle	19—Townsville
3—Alice Springs	7—Christchurch	11—Hobart	16—Perth	20—Wellington
4—Auckland	8—Darwin	12—Launceston	17—Rockhampton	21—Wollongong
		13—Melbourne		

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Complete VHF Station consisting of INOUE ICOM IC20, MAICO PSVR1 AC Power Supply to suit, STOLLE ROTATOR, 44 ft. tilt-over Telescopic Tower, 10 Element 2 Metre Beam, EVEREST 2 Metre 5/8 Mobile Whip—all for \$6.00 per week.

COMM. RECEIVERS: Realistic DX150A, \$234.20, \$3.00 per week. Trio 9R59DS \$178.50, \$3.00 per week.

These credit facilities are available throughout the Commonwealth

Stolle Rotators \$55 2 mx 10 el. Yagi \$20. Maico PSVR1 240v. AC, 13.5v 2.5a DC Power Supply for solid state 2 mx TRSV, \$41.50 Maico PS2 240v AC, 13.5v. 8a. Power Supply for Carphone as Base Station operation, \$33. Everest 2 mx 5/8 Mobile Whip (state base thread) \$16, with base \$20 2 mx 1/2 wave RW/Whips, RMW/2S, complete, \$7.50 Knock-Down Adaptor, \$7.14 Spring-Back Adaptor, \$5.52 Roof Mount Base, \$3.55, 432 MHz Roof Whip 5/8 wave, RMW-311/L, \$13.66. Rechargeable Alkaline Cells, size D, \$2 each.

Industrial and Medical Electronic Co.

6th Floor, 288 LITTLE COLLINS STREET, MELBOURNE, VIC., 3000
Phone 63-9258, A.H. 848-3018. Distributors for TEXTRON Group of Companies. See adv. p. 2

ROSS HULL MEMORIAL VHF/UHF CONTEST, 1971-72

The Federal Contest Committee of the Wireless Institute of Australia invites all Australian and Overseas Amateurs and Short Wave Listeners to participate in this annual Contest which is held to perpetuate the memory of Ross Hull whose interest in v.h.f./u.h.f. did much to advance the art.

A Perpetual Trophy is awarded annually for competition between members of the W.I.A. in Australia and its Territories, inscribed with the name and life work of the man whom it honours. The name of the winning member of the W.I.A. each year is also inscribed on the Trophy. In addition, this member will receive a suitably inscribed certificate.

We welcome proposals (in writing) to improve this Contest.

OBJECTS

Australian Amateurs will endeavour to contact as many other Amateurs in VK Call Areas and Foreign Call Areas under the following conditions.

DATE OF CONTEST

From 0001 hours E.A.S.T., 11th December, 1971, to 2359 hours E.A.S.T., 23rd January, 1972.

DURATION

Any seven calendar days within the dates mentioned above, not necessarily consecutive. These periods are to be at the operator's convenience. A calendar day is from 0001 hours E.A.S.T. to 2359 hours E.A.S.T.

RULES

1. There are two divisions, one of 48 hours duration, and one for seven days. In the seven-day division, there are four sections:—

- (a) Transmitting, Open.
- (b) Transmitting, Phone.
- (c) Transmitting, C.W.
- (d) Receiving, Open.

2. All Australian and Overseas Amateurs may enter for the Contest whether their stations are fixed, portable or mobile.

3. All Amateur v.h.f./u.h.f. bands may be used, but no cross-band operating is permitted. Operators are cautioned against operating transmitting equipment on more than one frequency at a time, particularly when passing cyphers. Cross-band operation to assist contest working is prohibited.

Such operation will be grounds for disqualification. Cross mode contacts will be permitted.

4. Amateurs may enter for any of the transmitting sections. The seven-day winner is not eligible for the 48-hour award.

5. Only one contact per band per station is allowed each calendar day.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign.

7. Entrants must operate within the terms of their licences.

8. **Cyphers:** Before points may be claimed for a contact, serial numbers must be exchanged. The serial numbers of five or six figures will be made up of the RS (telephony) or RST (c.w.) report plus three figures, commencing in the range 001 to 999, for the first contact, and will then increase in value by one for each successive contact. When a contestant reaches 999 he will then commence again with 001.

9. **Entries must be set out as shown in the example, using only one side of the paper. Entries must be post-marked not later than 7th February, 1972, and clearly marked "Ross Hull Contest" and addressed to Federal Contest Manager, Box 638, G.P.O., Brisbane, Qld., 4001.**

10. **Scoring for all sections will be based on the attached table. Approx. distances to be shown in the log entry as shown in the example. Failure to make this entry will invalidate the particular claim. Operation via active repeaters or translators is not allowed for scoring purposes.**

11. **Logs:** All logs shall be set out as in the example and in addition will carry a summary sheet showing the following information:

Name Call Sign
Address Division
Claimed Score

SCORING TABLE

Distance in Miles	32 Mc.	44 Mc.	420 Mc.	578 Mc.	Higher
Up to 25 Miles	1	1	2	5	10
26 to 50 "	1	1	5	10	25
51 to 100 "	5	5	15	30	50
101 to 200 "	10	10	25	50	100
201 to 300 "	25	15	50	150	250
301 to 500 "	20	25	100	250	300
501 to 1000 "	10	35	200	300	350
1001 to 1500 "	15	100	250	350	400
1501 to 2500 "	25	125	300	450	500
2501 to 3500 "	35	200	400	500	600
3501 to 5000 "	50	300	450	550	650
5001 and over	100	400	500	600	700

Operating Dates (7 cal. days)
Highest Score over a 48-hour period
was points.

Operating period:
from hrs. E.A.S.T. / /
to hrs. E.A.S.T. / /

Declaration: I hereby certify that I have operated in accordance with the conditions of my licence and abided by the Rules of the Contest.

Signed
Date
12. Entrants not abiding by the Rules of this Contest will be disqualified.

13. The ruling of the Federal Contest Committee of the W.I.A. will be final. No dispute will be entered into.

14. **Awards:** Certificates will be awarded to the winners of each section in each VK and Overseas Call Area. The VK contestant who returns the highest score in the transmitting section and who is a financial member of the W.I.A., will have his name inscribed on the Trophy which will be held by his Division for the prescribed period. A Certificate will be awarded to the contestant who shall not be the Trophy winner, and who returns the highest scoring log covering a period of any 48 consecutive hours.

Also, Certificates will be awarded for operating in the Ross Hull Contest and breaking any Australian v.h.f./u.h.f. distance record.

RECEIVING SECTION

1. Short Wave Listeners in Australia and Overseas may enter for the Contest, but no transmitting station may enter this Section.

2. Contest times and logging of stations on each band are as for the transmitting sections, however there is no 48 hour sub-section.

3. To count for points, logs will take the same form as for transmitting sections, but will omit the serial number received. Logs must show the call sign of the station heard (not the station worked), the serial number sent by it, and the call sign of the station being worked.

Scoring will be on the same basis as for transmitting stations, i.e. on the distance between the Listener's station and the station heard. See the examples given. It is not sufficient to log a station calling CQ.

4. A station heard may be logged only once per calendar day on each band for scoring purposes.

5. **Awards:** A Certificate will be awarded to the highest scorer in Australia or Territories.

EXAMPLE OF TRANSMITTING LOG (Brisbane Station)

Date/Time E.A.S.T.	Band Mc.	Em ss on Power	Call Sign	RST/No Sent	RST/No. Rcvd.	Dist. Miles	Points Claimed
24th Dec. 0900 E.A.S.T.	52	A3(a)	VK7ZAI	59001	59004	1110	15
0110 E.A.S.T.	52	A3(a)	VK4NG	59002	57051	330	20
0230 E.A.S.T.	144	A3	VK5ZK	59003	55063	890	35
0235 E.A.S.T.	144	A3	VK3ZJQ	45004	46021	850	35

EXAMPLE OF RECEIVING LOG (Perth S.w.I.)

Date/Time E.A.S.T.	Band Mc.	Call Heard	RST/No Sent	Station Called	Dist. Miles	Points Claimed
2nd Jan. 1000 E.A.S.T.	32	VK3ZDX	58221	VK8KK	1330	15
1025 E.A.S.T.	32	VK3ZCF	58195	VK6ZAA	2040	25
1110 E.A.S.T.	432	VK5ZDS/s	57061	VK6LK/s	80	15
3rd Jan. 0900 E.A.S.T.	144	VK3ZJQ	44102	VK6ZCN	1330	100

NOVICE LICENSING

Amateur Radio, October, 1971

as far as the Radio Inspectors' Department is concerned. The Committee's idea for an examining committee is an excellent idea, but what do you want to do with it? You can't have a Novice license at any 50% pass, but the administration of all these extra-fee examinations is a problem.

Paragraph 8. Mr. Black has set down a complex series of examination details in parts A and B to ensure that the Novice has to be tested in a way that answers to the points he makes a beautiful picture of a Novice in his shining white armour with Morse key built in, but the latter part of the paragraph shows that he may be different from a regular A.O.C.P. student! Mr. Black is going to test the Novice on Morse, on Spelling, on the use of the Morse key clicks and spurious radiations, an any suggestion that a Novice would be incapable of satisfactory operating after such a test would be not only a failure but a disgrace. The test will personally guarantee that none of his Novices will ever cause any of the above QRM or RFI. The latter part of the paragraph shows that I am sorry that you have had such a high percentage of "dropout" at your Oxford Radio Club. I have been in backward Melbourne I found that anyone who is really keen will gain an A.O.C.P. no matter what his profession or work happens to be.

Section 10. VK3TH, and I started the W.I.A. A.O.C.P. classes, on a business basis, in November 1933. George was manager, Bob Dalton was secretary, and I was the technical theory and regulations instructor. We conducted a maximum of 40 per class and at the end of the year we had 25 down to 25, but they were keen and we usually obtained 80% passes. Each pupil was automatically made a member of the A.R.L. and received all privileges and the magazine "A.R." for one year.

The members who operated on the broadcast band, I have been in backward Melbourne I found that anyone who is really keen will gain an A.O.C.P. no matter what his profession or work happens to be.

I had to resign in December 1934 to take a country broadcast station appointment. The present A.O.C.P. classes are a continuation from the previous 34 years later, and still very satisfactory.

Paragraph 7. The school boy I can quote is my elder son, VK3ZFM, who did as I said. I had him as a school master, but all the information I have quoted is accurate and you might do some research on the subject. The VK3 men were called "The Association of Radio Amateurs (N.S.W.)" later to become the VK3 Division.

Further on your reference to how hard it is to pass the A.O.C.P.—I know from vast experience in this field that if you are keen enough you can do it. It is not a matter of money, but all the advertisements as they pass, in Morse, and you write the formulae on cards and carry them with you. You can do it at any time at any time through your working day.

You say that you cannot recall a Geofford Club member ever having a Q. Geofford. Well, it is not the prerogative of the A.O.C.P. holder to use any mode of communication within the regulations that he favours? You say "Had they had Morse in the school they would have gained and retained Morse skills which they certainly do not have now." This is a true statement. The school is a w.p.m. test and is keen to get an A.O.C.P. he can raise his speed to 10 w.p.m. It is much more than a raise in speed to 10 w.p.m. so many c.w. men operate at this speed, so what is the point? The speed is controlled by the slowest operator of a group. I think your argument is that the Morse key or theory and regulations skill, the person who has just passed the A.O.C.P. and is not engaged in the business of Morse or electrical engineering is at a considerable disadvantage to the man in the field—until he gains some more practical experience.

I did not say that school physics covers the A.O.C.P. syllabus, but can you not see that the student is prepared for the A.O.C.P. examination by the school training and examinations are easier than to a mature person who has left school and has to learn the A.O.C.P. syllabus to study the A.R.L. Handbook or attend the W.I.A. classes. You are splitting hairs about the A.O.C.P. syllabus.

Paragraph 8. Mr. Black says that 160 metres is not used adequately in VK3 and he proposed that Novices could use 1800 to 1850 KHz. This is rubbish. The band is for the poor misguided people have a listen on this band, the W. KLF, etc. etc., signals coming through the air with considerable force when the DX does not come through and you could put Novices on for local practice, but

how could you police it? Or supposing the band is open, the 160 watt Novices would give up under the 180 watt stations. You have to have many stations to give you the 160 watt you sound like a "Police State". None of my friends would be interested in such regimentation and frequent examinations.

Referring to restricted hours applied by the Radio Inspectors' Department, in many stations to avoid L.T. and h.c.l.—what a negative attitude! It is not for the benefit of the Novice. Paragraph 8. It is good to hear that the Novice Committee is prepared to bring to the notice of the A.O.C.P. the need for special treatment for handicapped persons. It has been my experience as a member of the W.I.A. that the A.O.C.P. has been very helpful. Radio Branch has always made every effort to make it possible for a handicapped person who is very keen to gain the A.O.C.P. to do so with special consideration of the circumstances, and no genuine case has ever been refused.

You must realize that no set format could ever be drawn up to cover all situations. I agree the Institute should appoint a committee to do research on this subject. You suggest that "Stepping up the W.I.A. assistance for a handicapped person would make the government authorities who are responsible for caring for these people, and the A.O.C.P. in favour and the W.I.A. would gain allies in its efforts to retain our allocated frequencies, which are being used by the Government and the eyes of commercial interests"—unquote. Why do you and many other members of the W.I.A. seem to be so keen to get into the "back of usage" and "use our hands to greater advantage"? There is too much talk about "back of usage" and "use our hands to greater advantage". If anyone who says or even thinks that the bands are not used, let me make it their business to immediately get on the air, this mythical problem would disappear! Take a class of 25 persons, say, from 3.5 to 30 MHz., which most transmitters and receivers will cover, and I promise you a QSO every 10 minutes of the day or night, on one of them.

I do not have as much time to be on the air as you do, but my log shows 4053 hours of transmitting time, to date, since my contacts since 1930. Since my contacts since the air from September 1938 to December 1945 and I hope you were not, that is an average of 8.5 hours a day, 7 days a week, for 7 years and I know people who make more.

Paragraph 10. Re Mr. Black's letter in "A.R." for February 1938, my reference to the trouble to submit their opinions to the Committee immediately didn't mean that the people who are still against the normal five days a week would not be able to have a reply to your letter in "A.R." by about the 5th of the month, when an answer would be published.

Non Higginbotham's long study on the subject of NO NOVICE LICENSE was printed in July 1937—"this is reasonable in consideration of the biased in favour of Novices" and I did not "blind" points that the Committee put forward.

I take the subject of Novice licensing very seriously because of the repercussions which I know would take place and Mr. Black will only convince me about his claim of 10.4% of the Novice population very easily. I will take the statements submitted to the Committee prior to the compilation of the Novice report. You say that the Novice Committee is not biased in favour of Novices, but I do not see of sarcasm in your statement. "Most of the anti-Novice arguments submitted were pitifully weak and were not backed up by any logical reasoning."

I take it that Non Higginbotham's and my letter were not "backed up" by any logical reasoning.

Paragraph 11. Congratulations Rex on getting an FT200 transmitter and I hope to speak with you very soon.

Paragraph 12. It is the logical thing to continue the activity of the Novice Committee and let them submit a later report because until the Federal Convention has been held, no publicity had been given to the subject and no discussion amongst W.I.A. members, in this State, on the subject.

The Novice Committee produced its report on 1st April, 1971, one week before the 1971 Federal Convention, but Mr. Black's letter to the A.O.C.P. was not received until 1971. It is not rather obvious that there was not sufficient time to receive considered opinions in the Federal Convention. "A.R." before the report was made up? Mr. Higginbotham's report was published in July 1937. I suggest that you go back to the men in the Committee who made up their report WITHOUT any real arguments from the members of the W.I.A. in other States. Paragraph 13. I suggest that you must remember now that you are retired and no longer a school master therefore refrain from making any more "directed" arguments to your young Novices! You have "directed" to send my "for and against" arguments to my

Divisional Councillor, Dr. Deane Blackman. Instead, I am sending this to the Editor "A.R."

I agree Dr. Deane Blackman who is engaged in many other things, as Associate Editor, Ch. 7 for all the Apollo Missions, performs an excellent service and is enjoyed very much by the Novice community.

Many thanks for your long letter, you went to a lot of trouble, but this subject is not one to be taken up by individuals corresponding with the Editor. It has to be on the open forum of our "A.R." magazine.

Finally, I wish to make some comments on Mr. Michael J. Owen's "Federal Comment" in June 1937, on the handling of "Novice Licensing Again" Report of Basis.

Item 1. In these days when matriculation is definitely a more difficult examination than at the beginning of its introduction. Qualifications for the Novice examination are higher. Standards of examinations necessary to obtain a B.Sc. are much more complex than in my day. Why, for heaven's sake, talk about lowering the standard of the theory examination in order to issue a third rate A.O.C.P., called a Novice?

2. No comment
3. If you are keen enough you can practice
4. No comment
5. Too restricted. How do you police it?
6. No comment
7. This needs to be qualified. Would the certificate be awarded at the end of one year? I don't believe this would be practical. It would be unacceptable to most people. I have seen a few who have passed the A.O.C.P. and such and the few who go from A.O.C.P. to A.O.C.P. would have gained the A.O.C.P. If we were to lower the standard of the A.O.C.P.
8. No comment
9. Naturally
10. Naturally
11. No comment
12. Too restricted. How do you police it?

—Ivor Morgan, VK3DH

Following is Mr. Rex Black's letter in reply to Mr. Ivor Morgan's first letter in Sept. 1937. Mr. Morgan's letter was published in "A.R." so that readers can refer to Mr. Morgan's comments—Editor.

Mr. Ivor Morgan, VK3DH, Dear OM.

The Secretary-Manager of the W.I.A. has sent me a copy of a short copy of your letter to "A.R." on the subject of Novice licensing. I must thank you, therefore, for taking sufficient interest in the subject to write a letter contributing to the debate on this interesting topic.

I do not think that anyone would agree with the proposition that France, Germany, etc. could be classed as technically backward because they do not have Novice licensing in their countries. However, I do not think that it is easier to get an Amateur "license" in Britain than it is here in Australia. The examination is conducted by the G.P.O. but by the City and Guilds Institute and the exam pass mark is only 50% compared with our 70% pass. Under such circumstances it is doubtful whether a large number of licensees is obtained. I doubt 50% pass: need Novice licensing, as they can get adequate numbers of Amateurs with their own local knowledge.

3. The matter of getting a greater percentage of VK Amateurs into the W.I.A. is a subject of immense importance, but I cannot see much to be gained from the idea of a steady stream of resignations. After all, the W.I.A. is not like a trade union which one can join and then resign. It is a voluntary organization and it is hard to exert pressure on Amateurs who do not see any advantage in belonging. Problem is how to convince them. I think the answer is to present a steady stream of Associate members—as you state, a "dreadful deficiency"—and I just don't know the answers. The W.I.A. is not a trade union, it is a voluntary organization and it is hard to exert pressure on Amateurs who do not see any advantage in belonging. Problem is how to convince them. I think the answer is to present a steady stream of Associate members—as you state, a "dreadful deficiency"—and I just don't know the answers.

4. Ron Higginbotham quotes the fact that Associate members are not worth as much to the W.I.A. as Full members, as Associate members pay lower fee. Therefore, if we get Novices, they should be Full members. The Committee has no objection to this, and I can assure you, and we felt that more conservative members would resent having only equal status with the Full members. The W.I.A. is not like U.S.A. the A.R.L. accepts Novices as Full members. Anyway, whatever recommendation we made would have found someone to criticize. The W.I.A. is not like U.S.A. the A.R.L. accepts Novices as Full members. Anyway, whatever recommendation we made would have found someone to criticize. The W.I.A. is not like U.S.A. the A.R.L. accepts Novices as Full members. Anyway, whatever recommendation we made would have found someone to criticize.

I doubt whether there is any real reason for condemning the whole idea of Novices just

least a proportion of these into professional electronic careers.

A sub-committee of the Eastern Zone of the Victorian Division of the W.I.A. wishes to encourage a class of licence to provide a step, filling the large gap between the raw beginner and the existing high standard expected of the present A.C.C.P. holder.

The term "Novice Licence" has been commonly used, but it is unfortunate in that it implies a low standard—an alternative name should be investigated, such as "Restricted Licence", the reasons for this will be clarified below.

An examination for Restricted Licence should ensure that the holder is proficient to the normal standard, but only in those fields that he will use in his Amateur activities. It is suggested that the A.C.C.P. examination paper be in two sections. The first involving perhaps one and a half hours, to include power supplies, crystal controlled c.w. transmitters, and receivers for c.w. operation, and aerials. Restricted applicants would only attempt this first section. The normal A.C.C.P. applicant would also be required to do this section, and in addition follow on with a further section covering the more advanced technical topics until the time of two and a half hours had elapsed.

To prevent Novice sections of the bands becoming areas of low standard operation, there seems to be little merit in restricting frequencies, other than from band edge to the generally accepted frequency at which phone operation normally commences.

The question of pirate operation looms as the largest cloud on the horizon in the minds of many wherein cancellation of a short-term licence will leave functional transmitting equipment in the hands of an unlicensed operator. However this committee favours making Restricted Licences a continuing one. The standard of the examination should equip the Restricted licensee to operate competently from a technical viewpoint on c.w., whereas there is no justification for a time restriction. Older persons or students should not be forced into full A.C.C.P. standard by a time limit on their Restricted licence tenure.

Restricted licensing should encourage constructional work by reason of the simplicity of equipment involved, thereby discouraging the growing and disquieting trend towards commercial packages, the internals of which the operator may have negligible understanding.

With a firm foundation of Restricted licence operation, there would be adequate incentive for most persons to proceed to A.C.C.P. standard.

—Victorian Eastern Zone, W.I.A.,
Novice Licensing Committee

TV PIONEERS

Editor "A.R.," Dear Sir

I have just heard of the death of Tom Elliott VK4CZM and I am sad at his passing.

He was indeed a pioneer amongst Amateurs and he will be well remembered for his accomplishments.

However, over the years he has been credited with transmitting the first television images in Australia in 1958, in fact, a bronze plaque on the observatory in Wickenham, Victoria, Brisbane, used to attest to this.

In view of recent publications on the subject, the W.I.A. City Council, on advice from the Historical Society of Queensland, have changed the wording on the plaque from "The First Television Transmission to Australia" to "The First Television Transmission in Queensland".

This is now in accordance with the facts as there is ample evidence that the first public demonstration of television in Australia took place in Melbourne on 10th January, 1929.

At that time I was operating Amateur station 3H and was also in charge of the development of the equipment, and the picture transmission, so my efforts predate Tom's by almost six years.

My interest today is to pay tribute to a true pioneer and at the same time set the records on record.

G.H. Miles, VK3XKI

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The East Melbourne, VIC. 3002

A MEMBERSHIP SERVICE

LIMITED LICENSEES

Editor "A.R.," Dear Sir,

In the August issue of "A.R." was a reply by the Federal President of the W.I.A. to an anonymous letter concerning Limited licensees. The most noticeable thing about this reply was the rather juvenile repetition of the title "Mr Anonymous Letter Writer". If a person wishes to make a point while remaining anonymous, that is his prerogative. In fact, the desire to do so must be taken at least partly as a reflection on the organisation to which he is writing.

Having criticised the manner of Michael Owen's reply, I would like to disagree with its matter if the Institute is so interested in limited licensees, why does it deliberately discourage them from participating in the R.D. Contest? The rules of the Contest are such that the v.h.f. operator cannot help his State's score more than by making the five contacts needed to enter a log. In VK8, at least, considerably less stations on six metres wasted a week-end this year to score 20-odd points. I wonder how many of these will bother next year?

—Alan Jamieson, VK4FJF.

[The 1971 Federal Convention dealt with changing the rules of Contests and to the former of the Federal Contest Committee. The former referred to repeat contacts after specified periods, the latter forwarded the transfer of the Federal Contest Committee from VK8 to VK4. It is reasonable to assume that future 24-hour contests will include these provisions. —Ed.]

R.D. CONTEST, 1971

Editor "A.R.," Dear Sir,

Was I wrong or was this year's Contest among the best yet as far as friendliness is concerned?

One always meets old friends in the R.D. Contest, to my mind the best Contest I have experienced as an Amateur, both of one's own State and further afield, and I was not disappointed this year.

Brisbane and further north areas operators were not very happy about 30 MHz band conditions as the band was virtually not usable because of QRN. Several storms were over S.E. Queensland soon after the Contest started and I quit with lightning around the antennas.

I did not hear any 15 metre signals from my QTH, but logs will tell the story on this band. On 15 metres, VK8 was going great guns with southern States that I could not hear late Sunday morning.

Should we nominate a calling time for the 10 metre band? Say, late Sunday morning. To those who entered to win, for themselves or their State, I wish you good luck and good scoring. To those who came on to help make it a good Contest, thanks a lot, your efforts are appreciated. Let your Federal Councillor, or me, have suggestions for making this Contest better.

I hope to hear you next Remembrance Day Contest and spare a thought for those who are not with us.

—Peter Brown, VK4FJF,
Federal Contest Manager

OBITUARY

W. ("SKIPPER") SCHOFIELD, VK6WS

In Perth on 4th August, 1971, William ("Skipper") Schofield, VK6WS, aged 96 years, a very old time, passed away.

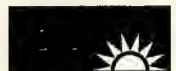
His interest in radio commenced in 1925 when he purchased the then newly released Gossner kit-set, a broadcast receiver, and successfully completed its construction. He later joined the W.I.A. as a student member, assisted with the A.O.C.P. classes, and then in his sixties, secured his Amateur licence with the call sign VK6WS. He participated in the administration of the W.A. Division for a number of years, and was also a leading light in the Subiaco Radio Society, later the Radio Society of W.A.

Although blind for the latter years of his life, he remained an active operator with the assistance of the A.O.C.P. classes who maintained his equipment in safe and operational order, until two years ago, when infirmity prevented further activity.

He was also a prominent yachtman and a member of Royal Freshwater Yacht Club, hence the affectionate sobriquet "Skipper". Many W.I.A. members have happy memories of week-end excursions on his ocean-going cruiser.

To his relatives, the members of the W.A. Division extend their sympathy.

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VK1VB-V. F. Burman, 140 Badminton St., Warragul, 2511
VK1ZAF-A. F. Blight, 1 Prad Pl., Gorrin, 2105
VK2ATK-N. G. McAlpin, 156 Hall Rd., West Footscray, Hill, 2120
VK2BSZ-T. E. K. Southwick, 55 Duntroon St., Hurstville Park, 2153
VK2DR-C. G. Duley, 4 Chambers St., East Maitland, 2323
VK2ZGT-R. C. McGregor, 44 Koola Ave., Killara, 2075
VK2ZG-G. C. Young, 18 Vernon St., Hunters Hill, 2110
VK2ZM-M. K. Morris, 69 Rous St., East Maitland, 2110
VK2ZOV-T. J. M. Young, 5 Grant St., Tamworth, 2340
VK2ZWT-D. M. Badcock, 17 Helen St., Cardiff South, 2285
VK2ZWG-G. J. West, 17 Huntleys Point Rd., Huntleys Point, 2111
VK2ZVP-T. G. R. Beech, 146 Harrow Rd., Auburn, 2144
VK3CC-S. S. Pearce, 115 Plenty Rd., Bundamba, 3083
VK3GZ-J. G. Colley, Station 22 Charles St., Traralgon, Postal: P.O. Box 118, Traralgon, 3644
VK3W1/R1-Wireless Institute of Australia, Victorian Division, Station 140 Neil St., Caulfield, Postal: 479 Victoria Pk., East Melbourne, 3002
VK3AAV-C. J. Dodd, 8/18-21 St. George's Rd., Armadale, 3143
VK3BDV-T. G. Dunn, 3 Allfrey St., East Brighton, 3187
VK3YZ-T. D. Daly, 8/105 Willenden Rd., 421
VK3VPL-L. A. Pearson, "Jubilee Cottage," Main Rd., Campbell's Creek, 3461
VK3ZJ-C. F. Yates, 1229 Heathcote Rd., Noble Park, 3174
VK4JD-N. M. Donnell, 33 Alice St., Atherton, 4853
VK4QS-R. Sayers, 6 Robinson St., Belgin Gardens, Townsville, 4810
VK4RC-Redcliffe Race Club, 134 Savannah St., Redcliffe, 4053
VK4UZ-A. H. Burton, 11 Rocks Rd., Oxley, 4075
VK4W1/R1-Wireless Institute of Australia, Queensland Division, Station: Mt. Mowbrall, Postal: Box 638, G.P.O., Brisbane, 4001
VK4W1/R2-Wireless Institute of Australia, Queensland Division, Station: 31 Haig St., Pinlicka, Townsville, 4816
VK4ZBL-A. H. Blake, 15 Kilby St., The Gap, 4261
VK4ZC-C. Gladstone, 51 Wambool St., Bulimba, 4171
VK4ZPJ-P. J. Evans, 118 Alura St., Ekinbi, 4271
VK5LW-G. E. Thomas, 112A Angus Rd., Westbourne Park, 5041
VK5QO-C. Wolcott, 17 North St., Collinswood, 5041
VK5ZAM-A. J. McKenzie, 319 Esplanade, Henley Beach, 5022
VK5ZM-A. Ferguson, Station: Cr. Kilnsey and Moyran Sts., Kalgoorlie, Postal: P.O. Box 554, Kalgoorlie, 5433
VK5BV-E. Wedger, C/o T.V. Station, Koolba Island, 6733
VK5RE-F. W. Bird, Flat 5, "Kailnya," 5 Welshpool Rd., Bentley, 5102
VK5ZKG-K. H. Gates, Station OTC Trucking, Station, Carnarvon, 8701, Postal: P.O. Box 348, Carnarvon, 4701
VK7HD-R. O. Reid, 30 Ebbidon St., South Hobart, 7000
VK7NR-A. N. Richardson, 69 George Town, Launceston, 7250
VK7VJ-C. M. Smith, 3230 Byrne Circuit, Moli, Darwin, 5184
VK9HL-R. Honper P.O. Box 251, Lee, PNG

ALTERATIONS

VK2WC-W. M. Cavanagh, 3 Hastings St., Wauchope, 2446
VK3BV-E. Fitzpatrick, 4 McIntyre St., Ham.Linn, 2200
VK3FO-T. C. R. K. Gibson, Spring St., Malvern, 3009
VK3JH-F. A. J. Porse, 8 Merrick Cres., Glen Waverley, 3150
VK3KL-C. T. Bellair, Flat 8, Debondy Crt., Lower Plenty, 3083
VK3RM-M. L. Branne, 43/45 Williams Rd., Windford, 3141
VK3SZ-L. J. Zeunert, Lot 174, Swift Dr., Glen Waverley, 3150
VK3XU-J. R. Oxley (Rev.), 48 Suffolk Rd., Surrey Hills, 3127

VK3AHT-R. Morton (Dr.), 152 Hearn St., Colac, 3250
VK3AHT-J. R. Handley, 35 Bulle Rd., North Escondido, 3041
VK3AJO-J. R. O'Halloran, 67 Maerdon St., Sunbury, 3029
VK3AS-D. J. Slade (Capt.), Lot 80, Michelle Ave., Watsonia North, 3087
VK3AK-K. J. Rehberg, 18/77 Alma Rd., St. Kilda, 3182
VK3ASO-Midlands Experimental Radio Club, Station Flora Hill, Bendigo, Postal: Institute of Technology, McCrae St., Bendigo, 3550
VK3AZM-D. L. Godfrey, 122 Nelson Pl., Wilmshurst, 3016
VK3BIB-E. F. Blake, 20 Moga Ave., East Kellor, 3042
VK3YAP-R. S. Proudlock, 25 Stuart St., Armadale, 3142
VK3YRA-M. Skop, 12/68 Alma Rd., East St. Kilda, 3182
VK3ZDQ-B. J. Treloar, 4 Ash Crt., Mulgrave, 3170
VK3ZOT-L. N. Tate, 6 Bindi St., Wandrina South, 3153
VK3ZHA-E. F. Blake, 10 Sheffield St., South Caulfield, 3163
VK3ZKL-A. Slamin, 72 Carnonvale Rd., Moorabbin, 3163
VK3ZVK-N. Hull, 4/44 Glenferrie Rd., Koo-woong, 3144
VK4CH-W. J. Jackson, 13 Colleen St., Lawnton, 4501
VK4HY-H. H. Varnes, 13 Empress St., Too-womba, 4550
VK4ZA-A. J. Millard, 15 Murney St., Red Hill, 4039
VK4ZMD-D. W. McGrath, 4 Stanton Ter., Glenview, 3110
VK4ZHE-J. W. Heares, 1/30 Russell St., Townsville, 4810
VK4ZHT-K. H. Tietze, 1420 Gynple Rd., Aspley, 4054
VK5AL-K. S. Harris, 26 Offier Ave., Bellevue Heights, 5059
VK5FS-S. A. Falk, Bradbury Rd., Myleor, 5153
VK5OT-T. M. D. Sobels, 86 Vallant Rd., Holden Hill, 5083
VK5PC-D. A. Greig, 3/30 McDonnell Ave., West Hindmarsh, 5007
VK5ZED-N. G. Scott, P.O. Box 455, Loxton, 5333
VK5DE-A. W. A. Storm, 123 Hastings St., Scarborough, 6018
VK5LJ-L. Lewis, C/o Government School, Yuna, 5533
VK5TR-T. W. Reed, 28 Roche Rd., Sorrento, 3030

CANCELLATIONS

VK3ZET-T. J. L. Jones, Transferred to S.A.
VK3ZIT-S. E. Gregory, Transferred to Vic.
VK3ZM-W. M. Adams, Not transferred to Vic.
VK3ZQE-L. N. Smith, Transferred to Tas.
VK3ZSE-T. E. K. Southwick, Now VK3BSZ
VK3BP-D. J. Terrill, Transferred to N.S.W.
VK3EB-J. E. Polkner, Not renewed
VK3WJ-J. Medlicott, Not renewed
VK3XT-G. F. Millard, Not renewed
VK3AH-H. H. McLaughlin, Not renewed
VK3AMC-H. N. Charles, Not renewed
VK3AIB-A. I. Berry, Not renewed
VK3AQ-A. W. Ames, Not renewed
VK3AQW-L. Woolf, Not renewed
VK3AGZ-J. G. Colley, Not renewed
VK3ASB-T. S. B. Roberts, Not renewed
VK3ASD-J. J. Grant, Not renewed
VK3AUT-A. U. Magnus, Not renewed
VK3BTD-R. Turner, Not renewed
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VK3ZTC-A. N. Richardson, Now VK3ZNR
VK3ZTE-D. M. Clancy, Transferred to N.G.
VK4EV-D. M. Weir, Deceased
VK4PY-P. E. Barber, Not renewed
VK4VV-Wireless Institute of Australia (Qld. Div.) Now VK4W1/R1
VK4ZRS-R. Sayers, Now VK4QS
VK4RV-J. P. Lyngath, Not renewed
VK5UB-E. Garner, Not renewed
VK5ZBK-E. J. Kenny, Not renewed
VK5ZDQ-E. J. Kenny, Not renewed
VK5ZEM-I. C. F. Modstruck, Not renewed
VK5ZFI-C. F. Thomas, Now VK5LW
VK5ZRM-R. W. McCartney, Not renewed
VK5DY-F. H. Smith, Left country
VK6JV-J. Vogel, Transferred to T.P.N.G.
VK6ZAU-W. R. Cooper, Transferred to Fiji
VK6ZJ-J. J. Hamilton, Now VK6ZFA/T
VK6BM-W. N. M. Nibbel, Not renewed
VK6MB-A. C. McBurnie, Not renewed
VK6TY-T. W. Flirth, Not renewed
VK6ZC-R. W. Flirth, Not renewed
VK6ZOR-R. G. Reid, Now VK6TR
VK6KN-R. W. H. R. Jones, Transferred to W.A.
VK6HT-H. D. Trickett, Not renewed
VK6SC-Q. R. H. Mould, Not renewed
VK6LB-J. R. LeBoght, Not renewed

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Marilyn Phone 73-3853
N.T.: Combond Electronica Pty. Ltd., Darwin,
Phone 16881



By H. F. EVERETT

G/s. P.O. Box 36, East Melbourne, Vic., 3002
(Times are in GMT)

The response to appeals for help in compiling this column are coming in well from old friends. More is needed though, please. Every effort is being made to make this column current and useful. If a rare DX-pedition comes up after this article is written but before it is read the only place of useful information may be the QSL address.

ITALIAN PREFIXES

The A.R.I. advises that the prefixes now in use correspond approximately to the regions and are —

- IP1—Piemonte, Liguria, Valle d'Aosta.
- IZ—Lombardy
- IZ3—Veneto, Trentino, Alto Adige, Friuli—Venetia Giulia.
- IZ4—Emilia
- IZ5—Toscana
- IZ6—Marche, Abruzzo
- IZ7—Puglia, Basilicata
- IZ8—Campania, Calabria, Molise.
- IZ9—Sicily
- IZ0—Lazio, Umbria
- IZB—Sardinia
- IZC—Tuscany, Elba, etc.
- IZD—Pontine Isles (Ponza, etc.)
- IZE—Naples (Capri, etc.)
- IZF—Boite Isles (Pallau, etc.)
- IZG—Ustica Isles (Pavignana, etc.)
- IZH—Pelagic Isles (Lampedusa, etc.)
- IZI—Pantelleria
- IZJ—Trinisi group
- IMO—Small Sardinian Isles.

However, existing licensees can retain their ITI or ISI calls.

Venezuela.—AM4 prefixes to mark 150th Independence to 31/12/71

Rarer Calls (mainly s.b. 14 MHz). VK-3AXQ finally worked Jim ZM1AG after seven

months of dog-piles and in his lists included VKOTM (on Macquarie Isl Nov.), 5H1BG, a couple of 3V1s and 5X3NA. VK1JP worked Gae 12. VSMAT and will have been looking out for 4J8BJ and 4J0DI DX-pedition on s.b. to Sakhalin Is. by UW3BI on c.w. 5DIACE on Roud Is. VK4XK mentions that ZL3PO/C will be on Chatham Is. until next Feb. working c.w. and s.b. most bands, that the 7 and 3.5 MHz bands held his interest for long periods and a few of his more exotic ones (mainly on c.w.) included ZK1AF (Niue Is., South Pacific), G1FF, FOOTG H20PF Murray also comments that Commonwealth Reply Coupons may go out of fashion with the increased postal charges this month. Most of these operators also worked some of the stations in the QSL list. George Cruickshank, VR4CG, on the Solomon (VK-2BUC at home), is looking for contacts on 14150 KHz. most evenings.

100 METERS

Ralph W1GHT will be on 1803 KHz., plus or minus 40 minutes of G.M.T. sunrise times stated on Oct. 10, 1951, Oct. 17, 1959, Oct. 24, 1959, Oct. 31, 1959, Nov. 7, 1959, Nov. 14, 1959 (VK-2BMS).

QSL INFORMATION

(Courtesy of VKs 3AXQ, 3JF, 2AXK, 4XK and 3AMP.)

- FUCH/PC—HB7L
- HBXUD—ON4V
- JY1 WAHUP
- FUDDK—KJNPV
- UMSFZ—WAEFL
- VPMF—VBCOO
- VPTVAG—VBOGT
- VQSDK—VDSAKV
- FRKKA-A Box 28, Noumea.
- KX4DC—Box 967, A.P.O., San Francisco, 96356, Calif.
- OD5ET—Box 4648, Beirut
- TI4AS—Box 1814, San Jose.
- 3Y2CX—Montreal, Port Vila.
- SWIAK—Box 721, Apia.
- 5X5NF (Darlene) VDSAKV.

QSL managers normally QSL via the Bureau although some will QSL direct against a self addressed envelope and IRCs enclosed.

DX-peditions. WU7UP/KM6 from Midway Is. from about 31st to 34th Oct. and again 1st and 2nd Nov. From 25th Oct. to 1st Nov. Kure Is. will be activated (but there will be some phone

patch traffic). Operators are WU7UP/KH8CM, KH8GMP and KH8GPP. Modes will be c.w. 14005, 15005 and s.b. all bands. QSL to KH8GCM with s.b. and usual IRCs, no cards via bureau (courtesy KH8GZ).

Other Roy Jonsson, VK4ND, has QSY'd for six months to Lee where he hopes to get on as VK3PD QSL via VK3 Bureau (courtesy Eric L3042).

VK4JZ. Contest results as printed on page 15 of June "A.R." amend J4JYJ to read J4JYJ and add J4XLR with a score of 980 points. (VK4ZDK)

Awards. Balearic Isles (EA5 Radio Club Box 24, Palma, Mallorca). 10 EA5 contacts on two bands or 7 on 3 or more bands c.w. or phone. QSL cards contacts after 1/1/70, certified list and 10 I.R.C.s (free to blind and paralyzed ops).

12 Award. 2-way c.w. or phone, any band from 1/1/33 with 21 J47 prefix stations, list with QSL cards and 10 I.R.C.s to N.J.D.X.C. Award Manager, Box 76, G.P.O., Santa, Myagi, Japan.

Venezuela Radio Club announces a diploma for five QSOs with 4X4 calls, any band and mode, logs to V.R.C. Box 310, Valencia, with 8 I.R.C.s (or US\$1) before 31/1/72.

Most participants in all these who have assisted with information: Are there any volunteers please to take over this column?

COOK BI-CENTENARY AWARD

The following additional stations have qualified for the Award.

Cert. No.	Call	Cert. No.	Call	Cert. No.	Call
1381	AX5AK	1386	YAIHD	1390	JA1KRU
1382	3B4BL	1387	W4BBD	1391	AX1ZB
1383	AX5RZ	1388	G3MGP	1392	C21AA
1384	GT1K	1389	PA0KA	1393	AX3QV
1385	PZ1AC			1394	AX5CY

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE			
VKMS	319/343	VK1AF	286/295
VKGRU	318/342	VK4FJ	285/307
VK3AH	318/335	VK4TY	284/289
VK4KS	307/343	VK4JZ	276/287
VK6MK	303/384	VK2AAK	274/279
VK4AB	298/314	VK4ZE	271/274

New Members.			
Cert. No.	Call	Total	
119	VK3ZB	108/107	
120	VK4QA	101/101	
121	CH1AA	117/113	

Amendments.			
VK4D	236/345	VK3TG	185/189
VK1AMX	235/235	VK3J4	145/143
VK4RF	218/216		

C.W.			
VK3QL	303/336	VK1NC	273/280
VK3AFQ	300/315	VK2AHK	271/280
VK4FJ	289/315	VK1XJ	261/263
VK3VL	288/303	VK4RU	265/268
VK4AB	284/283	VK4TY	258/272
VK1AGH	282/286	VK4TL	255/280

New Member.			
Cert. No.	Call	Total	
88	VK4LV	101/101	
Amendments:			
VK4D	182/210	VK4RF	182/202

OPEN			
VKGRU	317/343	VK6MK	303/334
VK4SD	315/290	VK2APX	302/314
VK3AGH	314/334	VK4ZD	291/303
VK3VN	306/338	VK3J4	290/308
VK4KS	308/337	VK4UC	289/298
VK4TY	306/331	VK4FJ	287/323

New Member.			
Cert. No.	Call	Total	
138	VK5PY	109/112	
Amendments:			
VK4D	251/289	VK4LV	106/106

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BLIND OPERATORS

How many Amateurs have contacted VK3AVI? Did you realise that the youthful voices whose operators may sometimes be heard clanking around more or less peacefully for a "go" at the mike are those of blind kids?

The writer paid a brief visit one night to the Burwood School of the Royal Victorian Institute for the Blind a few weeks ago and found the shack a hive of activity and excitement. Some members of W.I.A. have cheerfully entrusted themselves for duty as operators at Burwood because the technical mysteries of Amateur Radio are beyond the age group which is attracted. Most of the participants attend the sessions in night attire and dressing gowns and are cheerfully oblivious of time differences occasioned by longitude. "It's all," he said, "good manners" and similar comments are not infrequent.

It is a great game for the blind children each Monday night during the school term. A Galaxy transceiver is used under the supervision of the operator rostered for the night.

The most usual call from VK3AVI is "CQ DX 30" and the wall testifies to the results. Using a long wire in place of a beam aerial may not be the best nor yet the final arrangement for this station, but there are verifications aplenty including KLT, JA1, ZHL, YV1, W1V, W1L to name a few. When bedtime comes round—that's it for another week.

Not all activity on Mondays is centred on Amateur Radio, however, and in another room may be found Mr. J. A. Paterson's latest creation, the first of a series of those of the children who have some residual vision (blindness doesn't necessarily mean complete loss of sight) shooting a gallery of tiny light beams to aim and register a "hit". Mr. Paterson is an electronics wizard employed by the S.E.C. and obviously enjoys his night with no interruption.

We watched while a young sharpshooter pressed the trigger of the "rifle" and manoeuvred the resulting spot of light on the target area. The diameter of the spot was generous compared with the area of the bullseye, but quite a challenge to someone with poor vision. To make it more of a challenge, a finite time of light-beam duration encourages the marksman to make up his mind quickly or else he will be left in the dark with no illumination.

Matron Dunell is grateful for the interest displayed by W.I.A. members and others who make it possible for her small charges to derive pleasure and some measure of education during their leisure time. Incidentally, the lives the children lead are seldom dull and they can favourably impress visitors with the diversity of their achievements.

How about it? Any more bright ideas?

(Article from the Supdt. of Public Relations, Royal Victorian Institute for the Blind, 357 St. Kilda Road, Melbourne, Vic., 3004.)

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SILENT KEYS

It is with deep regret that we
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VK2AWD—A. W. Dever.

VK4CM—T. M. B. Elliott.

VK6WS—W. Schofield.

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ALL must get AR7 Rx with mains PSU, A-C-D-E coil boxes, all functions working. \$45. AT7 Tx with type 5 PSU, A.C. function and control box, all manual, connecting cables to spare, AM/CW can be readily converted to DSB, \$30. Pys No. 62, 110V. Transceiver 12v. DC, 1.2 to 10 MHz. AM/CW, manual and spares, headphones, pyc, mic, 100 ft. aerial in carry pack, \$40. Heavy duty 55 ft. Tower with 10 bolts together galvanneal 4 ft x 9 in. triangular sections, built-in ladder, \$35. Realistic DX-150 Rx, new in original carton, \$175. Offers considered. Bob Lockley, VK2KJL, 96 Waddell Rd., Brixton, W.A., 6157. Phone (082) 39-3529.

AR7 Receiver with P/S, no coil boxes, \$38. Field Strength and Noise Meter (to 150 MHz), 8v. DC, 240v. AC, \$20. No. 18 Set, \$10. 14 Lever Key Switches, with Indicator lamps in laminex finish pen, new, \$10. W. H. Waller, 23 Ashmore Rd., Forest Hill, Vic., 3131.

ATTENTION librarians and others. Pre-war issues of "QST" for sale: 1928; Aug. and Dec.; 1927, Jan., Jan. Aug., Sept., Oct., Nov., Dec.; 1926, Jan. and a full run from April 1928 to Nov. 1939. Some of 1926-7 lack covers, otherwise in new condition. What offers? G. B. Ripples or VK6GR, 424 Goodwood Rd., Cumberland Park, S.A., 5041.

BARGAIN (see August Hamads). K.W. Vespa air-band Tx 150-10 mc, 80w. PER SSB/AM/CW, H/8 PSU, \$150 secures or best offer over \$120. 160-10 mc Mobile Whip, \$20. Lennox VOX/PTT two-stage 100w. Table Mic, \$15. VK7MT, 73 Westbury Rd., St. Laurence, Tas., 7250. Tel. 44-1382.

COLLINS KWS-1 and 75A-3 combination for sale as one unit. This is a complete unit with 1000 valves and filters included. A beautiful SSB signal and winner of many DX Contests. \$550 for the pair. Jack Phelan, VK1GD, Phone Canberra 95-6387.

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FOR SALE: DAK-3 Receiver with cables, wiring diagram and spare parts. AIRS Com. Receiver, with 100 ft. of copper aerial cable. Also many other parts to interest. Write to: Army and Air Ring 520-1059 or write G. Harrison, 33 Cambrai Ave., Engadine, N.S.W., 2233.

FOR SALE: Estate late Jack Small, VK6FF. Home-brew single-band SSB Transceiver, 7 Mhz. Complete, all tubes, pyc filter, etc. Tx pair \$148.50. Power Supply and speaker, 100w. in separate unit, \$55. Contact: Bill Moore, VK2HZ, 29 Pitt St., Springwood, N.S.W., 2777. Phone Springwood 51-1724.

FOR SALE: Galaxy III. Transceiver, ex late VK2MWS. SSB 20-40-80, good order with handbook, mic. (Ronette insert, D104 case), \$190. AC Power Supply, local production, will suit any set, \$60. Also Class C Wavemeter, 200v. AC, \$10. VK2CH, "Amaroo," Quirindi, N.S.W., 2343.

FOR SALE: New bench PSU, 3-25v. continuously variable, 1 amp, SC protection, \$25. Newly constructed VFO 50w. Fx 2 mhz multi-channel. Bass Station, 12 Ktals for Chans. B & C, \$25. Bass loaded Whip, readily adjustable for all i.f. bands, \$15. Edystone Bug, 612v. 9 mhz. SSB Tx filter, 1.4 Mhz., recommended, matching smaller, 1.4 Mhz., \$80 Ktals, \$35. 612v. SSB Tx filter, 1.4 Mhz., \$15. Edystone 1200 Dial Assy., \$15. Qty. 8146, 1121 Valves. VFO 7.6-11 Mhz., complete with 100w. xtal, gives 9 mhz. op. on all HF bands, \$30, 200w. AM Txl controlled 160 mhz Tx incl. PSU, PTT, 100v. circuits, \$103. Ktals, 3000. Large assortment of transformers, PCBs, relays, etc., 388V, 11 Catherine Pk., Frankston, Vic., 3109. Phone 783-1408.

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FOR SALE: Star SR550 Communications Receiver, covers 190-8 metre Ham bands. Instruction manual and speaker. 240 volt in-built power supply. Mrl condition. \$100. J. P. Mayer, P.O. Box 181, Mundubbera, Qld., 4620.

FOR SALE: Vespa FTDX400 with FVDX400 remote VFO. Condition as new, \$375. or take offer. VK2WD, 44 Avian Cras., Lane Cove, N.S.W., 2086. Phone 42-8086.

FOR SALE: Vespa Musen FL2008 SSB Transmitter, outstanding signal, \$200. O. Sars, 12 Russell Ave., Warners Bay, N.S.W., 2282.

KX-TX Drake 28, 80-10 mc, 250 speaker, O multiplier, peak/-notch, 2AC crystal calibrator, \$240. Hammerlund H250, 160-10 mc, crystal filter, 650w. CW, 100w. SSB, 100w. CW, 100w. CW, 100w. CW, \$170. Both plus 117v. transformer for \$340. VK3AJZ, 5 Duffryn Pl., Toorak, Melb., Vic., 3142.

SELL: Class C Wavemeter, complete, \$20. Crystal Calibrator No. 10, \$12. 3-inch Cro, \$20. Two Pye Carphones, both converted \$2.85. AC/DC, also two 100w. CW, 100w. CW, 100w. CW, 100w. CW, \$170. Both plus 117v. transformer for \$340. VK3AJZ, 5 Duffryn Pl., Toorak, Melb., Vic., 3142.

SELL: Swan 500C, new, AOC, ALC, latest 10-16 ft. filter, Transceiver with power supply, all mint condition. FT2F 2 metre FM Yaseu Transceiver, with DC 1200 band new. Phone Australia 20-6135, Bus. 24-1211 (Melbourne).

WANTED: Send-change motors and I-P indicator for transformers in suit 2 to 10 watt. Send change for Compex sets. Transformers are marked T16 or A15064. State price required. Also Vintap, Radios complete with Norn Speaker, early 1900's, good price paid on details. O'Brien, Edgar Rd., San Ramo, Vic., 3525. Phone 107.

WANTED: Circuit diagram, Handbooks or any information on Marconi Type CR15/3 Receiver. Will copy and return if desired. Bill Verrall, VK5VW, 7 Liffie Ave., Flinders Park, S.A., 5025.

WANTED: Collins EUI-2-3 Receiver, Johnson Valiant Transmitter, CRO 5-Mhz. bandwidth suitable TV servicing. Also general coverage Receiver, suit SWL, such as Edystone, 100w. CW, \$60. Hallcrafters, Hammarlund, AR88, etc. A. C. Hawker, VK3JB, Box 33, Dimboola, Vic., 3414.

WANTED: DC-OC Converter, 12 volts input. Will exchange Nixky modulated oscillator 73R [to 30 MHz.], VK3EJ, 31 Roslyn St., Burwood, Vic., 3125. Phone 289-2217.

WANTED: Drake TS3 Receiver in good condition, preferably with O Multiplier. Also kysar paddle, surplus squarer. Write giving full details, name and asking price. Andrew Davis, VK1DA, 32 Kalgoorlie Cres., Fisher, A.C.T., 2011. Phone Canberra (062) 33-3333, business hours.

WANTED: Murphy British Naval VLF Receiver or similar type, with range 20 to 100 kHz or lower. R. F. Finher, VK3BAC, 241 Royal Rd., Parkville, Vic., 3052. Phone (business hours) 340-3921.



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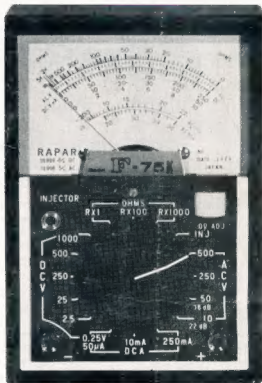
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